The Cotton Gin and Oil Mill

PRESS

55th year

FEBRUARY 27, 1954

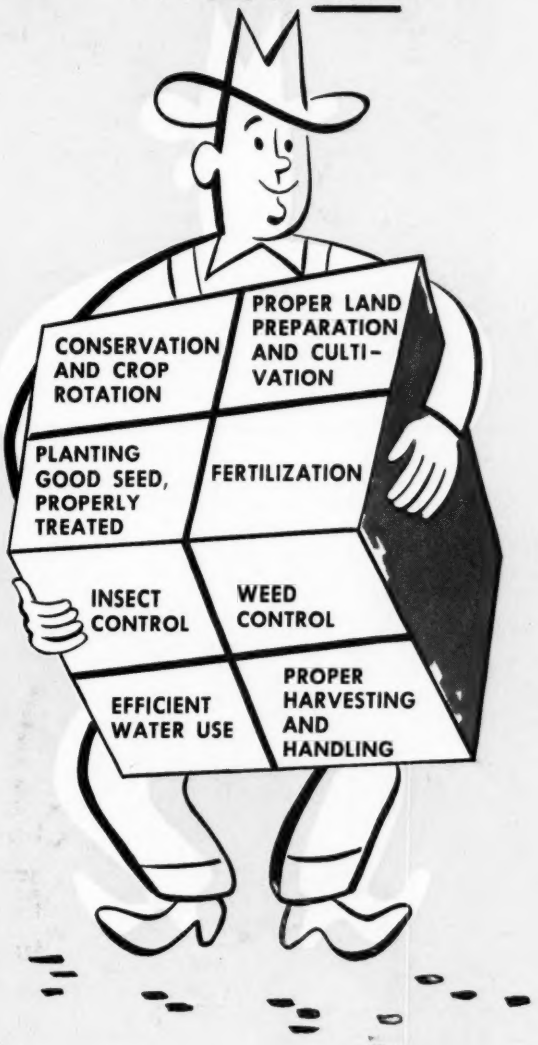
THE MAGAZINE OF THE COTTON GINNING AND OILSEED PROCESSING INDUSTRIES

A PROGRESSIVE AND RESPONSIBLE PUBLICATION

NOT THIS...

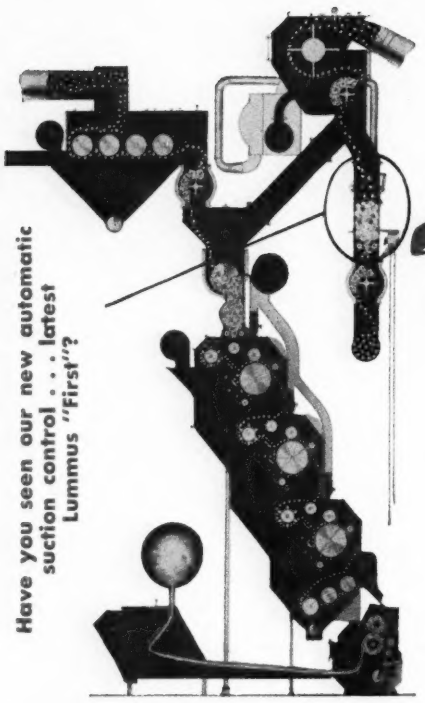
This farmer goes all-out for one or two approved production practices, but limits his acre-yields by ignoring others equally important.

...BUT THIS



But here is a farmer who knows he must adopt *all* approved practices as a single "package" to obtain maximum acre-yields at lowest cost.

Special BETTER PRODUCTION PRACTICES *Issue*



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Lummus is doing more to put gins on a better paying basis.

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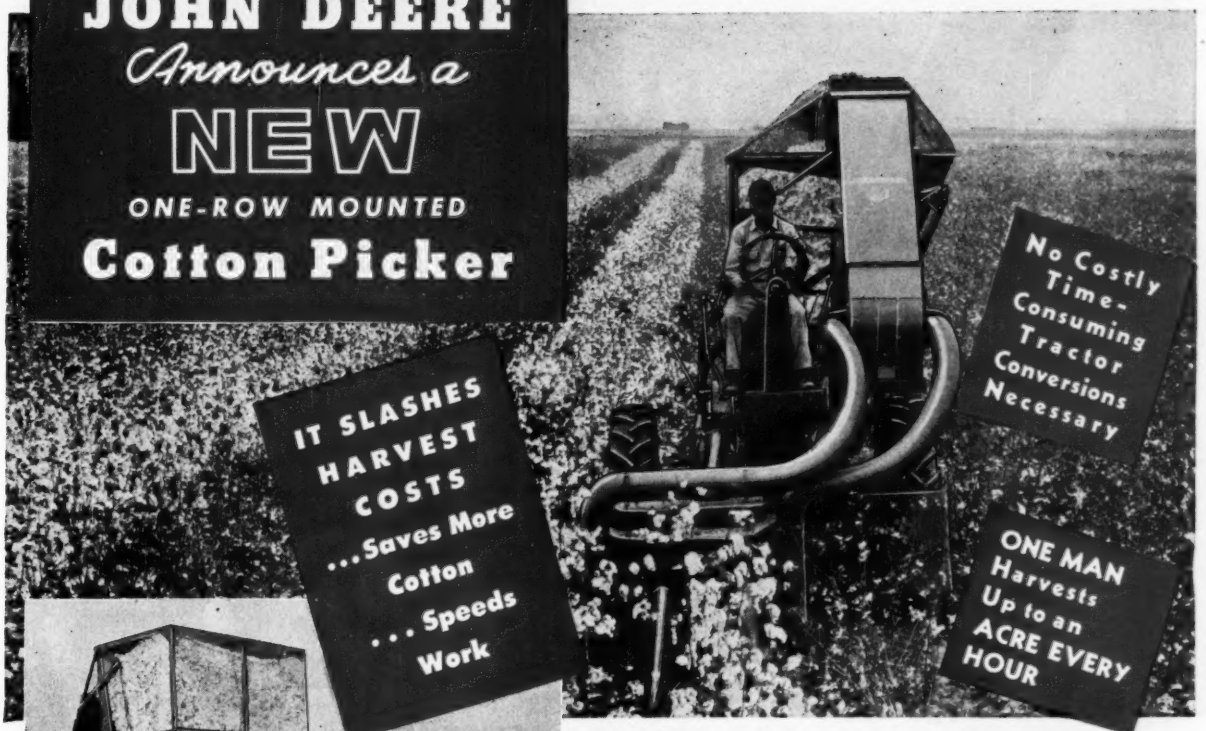
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No Costly Time-Consuming Tractor Conversions Necessary
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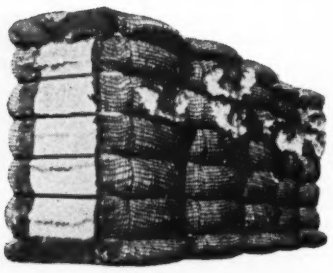

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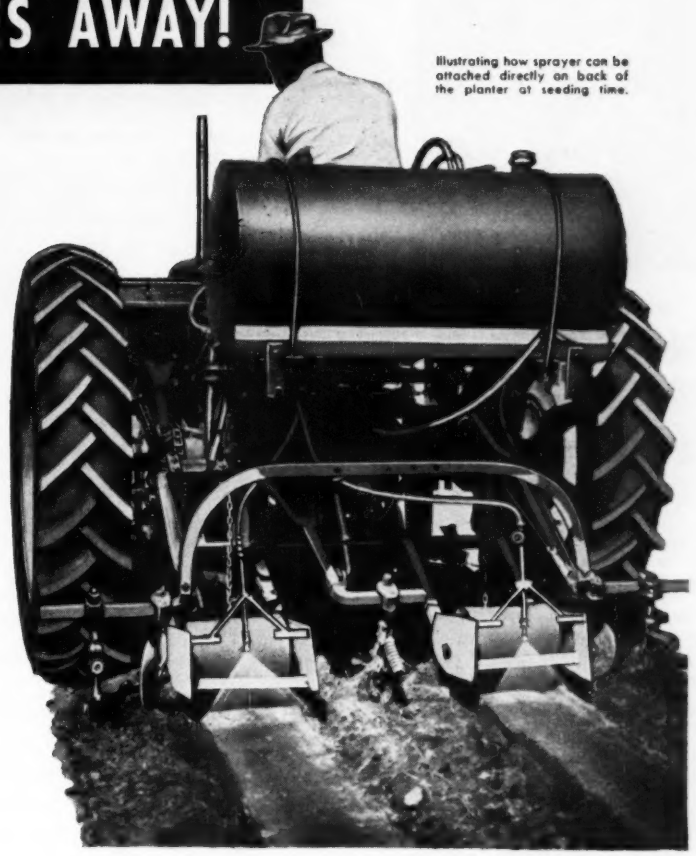

Illustrating how sprayer can be attached directly on back of the planter at seeding time.

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★ ON OUR COVER:

The importance of farmers' adopting all approved better production practices as a "package"—rather than adopting some and ignoring others equally important—is the theme of this special issue which the artist has suggested in the cover drawing. Authoritative articles throughout the issue tell how to do this in 1954, thereby assuring maximum acre-yields at lowest cost.

Cover by Tom Grimes

VOL. 55 FEBRUARY 27, 1954 NO. 5

The Cotton Gin and Oil Mill PRESS...

READ BY COTTON GINNERS, COTTONSEED CRUSHERS AND OTHER OILSEED PROCESSORS FROM CALIFORNIA TO THE CAROLINAS

★ ★ ★

OFFICIAL MAGAZINE OF:

National Cottonseed Products Association

National Cotton Ginners' Association

Alabama Cotton Ginners' Association

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California Cotton Ginners' Association

The Carolinas Ginners' Association

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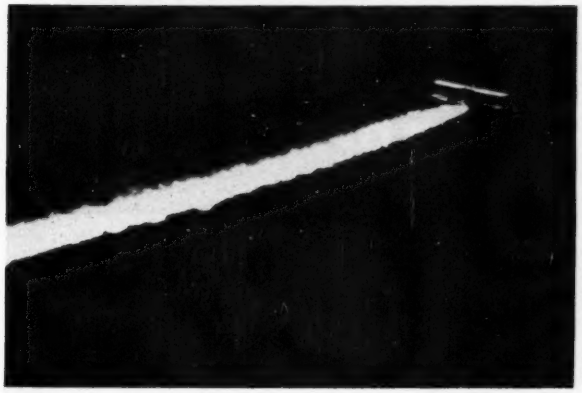
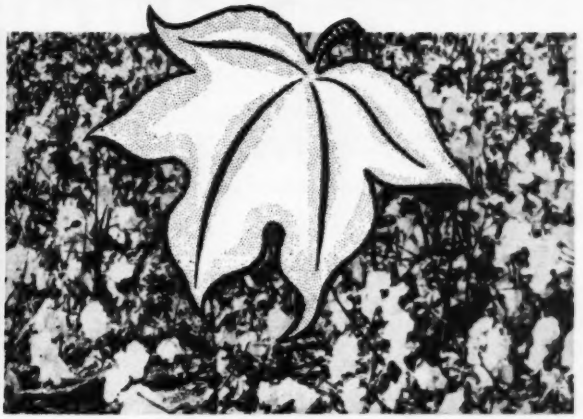
IT PAYS TO USE CHIPMAN POISONS *and* DEFOLIANT





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THESE 8 FACTORS CAN HELP MAKE YOUR COTTONSEED CRUSH MORE PROFITABLE

How profitable a crush is depends, of course, on how much it costs you to get oil on the market—and how much more you can sell it for. These are the fundamentals your mill faces, and the real reason for the interest in today's high-yield solvent processes.

Whether you look to this higher or extra yield to enable you to pay more for seed today, or to strengthen your mill for still tougher competitive conditions tomorrow, the following 8 profit supports offered by Lukenweld filtration-extraction may interest you.

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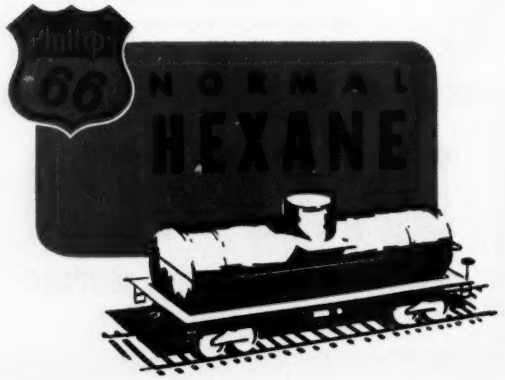

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Special Products Division

Bartlesville, Oklahoma

Make Cotton Pay More in '54

Conservation and Crop Rotation —A Report From the South

"All in all, the South is doing the best job of farming it has ever done when measured by the progress being made not only in farming profitably but for the land's sake."

LONG YEARS of cropping sloping lands to row crops has been responsible for blighted, abandoned farms such as the one pictured here.

THE MOST SIGNIFICANT development in soil conservation throughout the South in recent years has been the sharp trend toward rotations including grasses. Naturally in stepping up the acreage of grass lands, Southern farmers seek also to broaden their farm income base by adding livestock to balance crops. But in adding another arm to their farming—the livestock arm—they have also contributed mightily to better treatment of our sloping lands.

EUGENE BUTLER is President and Editor, The Progressive Farmer, Dallas.

By EUGENE BUTLER

Not long ago, Dr. H. H. Bennett, former chief, Soil Conservation Service, said, "At last we are getting busy with grasses and legumes in Southern agriculture." And so it seems. At the time the 13 Southern States had seeded better than 80 percent of the new pastures in the nation's soil conservation districts. They were adding grasses and legumes in pastures at the rate of 2,075,845 acres a year. "And," continued Doctor Bennett, "the annual rate (of pasture seedings) continues to rise from year to year."

In time past, we in the South have not attached enough importance to the influence of grass on soil improvement. For years we have heard that to build soils we must turn under legumes. Certainly there is no reason to lessen our efforts to make the South a land of legumes. But we are now finding that grasses and legumes working together, particularly the deep rooted biennial and perennial kinds, do a much better job of soil building than is possible through their separate use. And the larger the percentage of perennials in the mixture, the more valuable is the pasture in soil and water conservation.

Annual legumes such as the vetches, peas and lupines, add plenty of nitrogen for row crop farming. A good crop of vetch will add more nitrogen to the soil than is removed by a bale-to-acre cotton crop. But organic matter is required to make our soils more drouth resistant. And annual legumes used in our row crop farming system do little more than maintain the soil's organic content. To increase materially its organic matter, and to improve the soil's water-holding capacity, nothing is finer than a grass sod.

Many farmers are finding that their soils have little capacity to take up rainfall. Sometimes a hard pan, or plow sole, seems to stop the downward penetration of moisture. Some farmers attribute this condition to the use of heavy machinery over a long period of years. And many are seeking a solution through deep plowing or subsoiling. But on heavy soils lacking organic matter, deep plowing doesn't work well. Its effects are of short duration. With a good rain, the particles fuse together and seal over the trench made by the subsoiler standard. Deep rooted legumes such as alfalfa or biennial sweet clovers are much better for opening up such soils. They go a lot deeper and open up the soil more effectively than deep plowing. And they put organic matter and plant food down in the soil in the feeding zone of deep rooted plants.

Organic matter is the great need of Southern soils. It is almost a cure-all for our soil problems. In the Central Texas Blacklands, there still remain

small areas of virgin grassland. These soils with 5 to 5½ percent organic matter hold their aggregate soil structure when wet. They can absorb 8 to 10 inches of rainfall an hour. Nearby soils similar in their virgin condition, but planted continuously to row crops for 60 odd years, have lost much of their organic matter. And with the loss of organic matter has gone the capacity to hold moisture. When wet, such overcropped soils melt and their particles fuse, soon shutting off moisture penetration. They can absorb only about an inch of rain per hour. With hard, heavy rains on land of this type, there is much runoff and soil loss.

Soil conservationists recognize three kinds of land from the standpoint of use:

1. Land suited for cultivation.
2. Land suited for limited cultivation.
3. Land not suited for cultivation.

These three kinds of land are again broken down into classes. The class is the guide both as to how the land should be used and the treatment which will insure it against erosion. For example, Class I land is only slightly subject to erosion. It can be easily protected and kept highly productive by growing cover crops between row crops and the proper management of crop stalks and stubbles. Such conservation methods would be entirely inadequate in Class IV land. This class land has low to medium fertility. It is gently sloping to rolling and may be severely sheet eroded. Such land, if cropped at all, should be kept in close-growing crops three-fourths to four-fifths of the time. And medium to long rotations should be used.

To the farmers who wish to farm the land both profitably and safely, the big job is to select the best combination of conservation practices. In the U.S. there are 59 major soil conservation practices that can be used. The right combination of these practices will stop erosion, conserve rainfall, and keep the land productive. If the combination is right, each practice supports and supplements all the others.

What conservation practices are being recommended in the South, and what results can be expected from them?

At the Texas Research Foundation near Dallas 17 different rotations are being used. Best results have been obtained from a four-year rotation of cotton, maize, alfalfa and grass sod, well fertilized. This rotation produced 1,179 pounds of seed cotton, as compared with only 875 pounds for unfertilized, continuous cotton. Such grasses and legumes as alta fescue, orchard grass, alfalfa, Dallis grass, K. R. Bluestem, Side oats grama and Madrid sweet clover, have been used in pastures to produce 200 to 300 pounds of beef to the acre. Dr. T. C. Longnecker, of the Foundation, says, "If fertility and yields in the Blacklands are to be restored, the land must be kept in grasses and legumes about half the time."

On the U.S. Blackland Experimental Water Shed near Waco, Texas, two systems of farming have been compared on 300 acre blocks: (1) a four-year rotation of cotton, corn, cotton and oats with no legumes and rows run up and down slope, and (2) a three-year rotation of cotton, corn, and oats, top seeded with Hubam sweet clover. On the 300 acre block with 210 acres cultivated, the conservation farming produced $16,261. This compares with only $13,515 income from the 300 acres farmed on a straight row basis.

In East Texas, Southeast Oklahoma and Southern Arkansas and Louisiana, rotations usually include a cash crop and a feed crop. Summer and winter legumes are grown for cover and green manure. And in much of this area annual lespedezas make an excellent crop to use in rotations with small grain, cotton and corn.

Sweet clover is by far the best soil improving legume for Central and West Texas. The biennial types such as Madrid, or alfalfa, are preferred as soil builders because of their deep root systems. But the prevalence of cotton root rot makes Hubam (annual white sweet clover) popular on many farms. A rotation of cotton, cotton, oats and Hubam is ofter used to reduce soil and water losses. But with such a rotation, terracing will be needed to prevent gullying, if there is much slope.

Peanut growers in the Cross Timberland areas of Texas find that four rows of grain sorghum alternated with eight rows of peanuts will prevent blowing on loose, sandy soils. The sorghum stubble is left standing through the winter and early spring. And rye or some other small grain is often sowed in the peanut strips after harvest to give the land adequate cover.

Nowhere have farmers used grass rotations more effectively to improve soils and increase income than in the rice areas of Texas, Louisiana and Arkansas. A very effective six-year rotation for the rice grower with beef cattle provides two years in rice, with the second year rice overseeded with a permanent pasture mixture. White, Alsike, Persian, Louisiana Red and hop clovers and Dallis, rye grass, and tall fescue are used to provide pastures through the fifth year of the rotation. In the sixth year, the row crop preceding rice can be soybeans, corn, grain sorghum or sweet Sudan grass.

Long time rotations featuring grasses

(Continued on Page 15)

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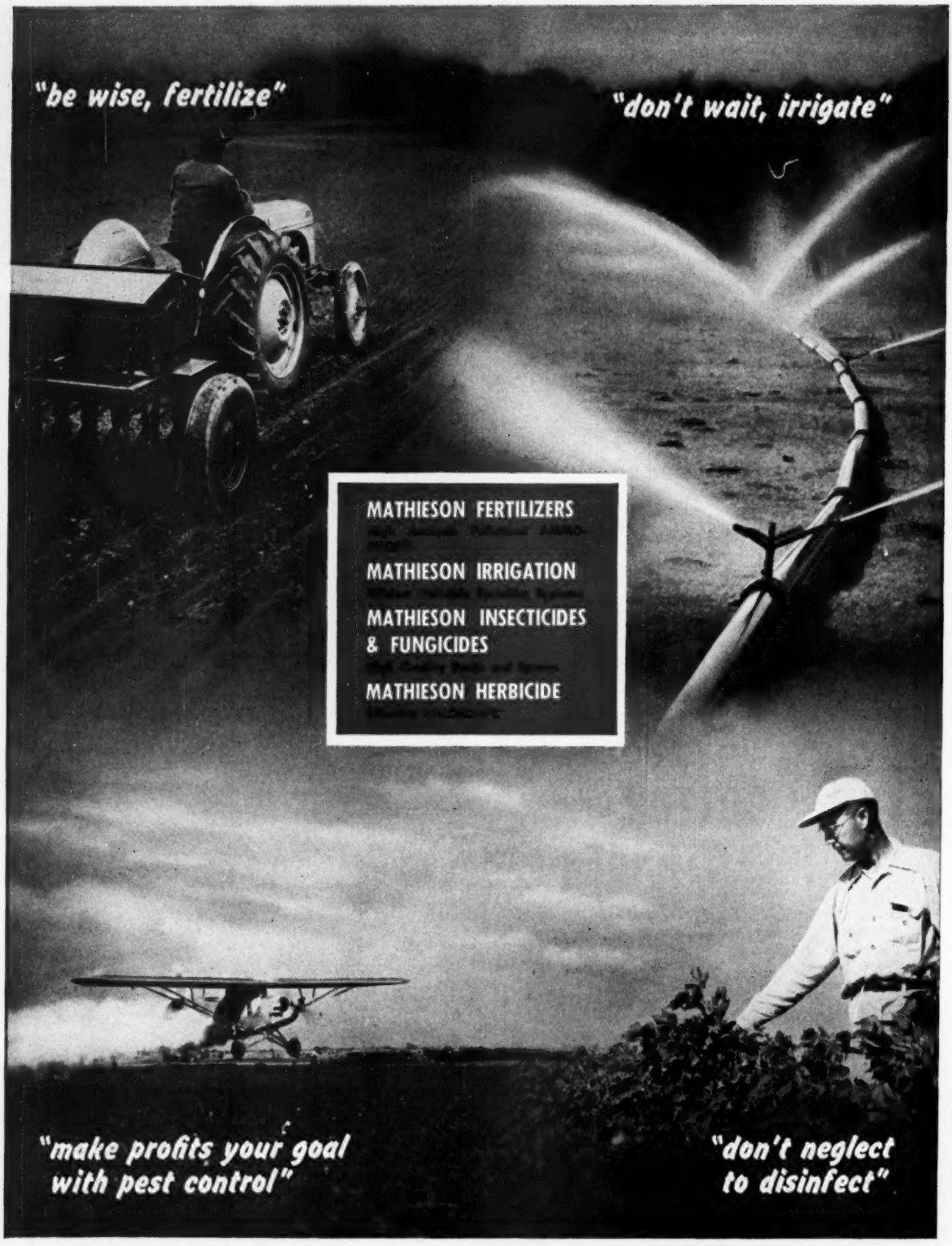

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Conservation

(Continued from Page 12)

and legumes are also used to advantage on cotton farms. The Arkansas Extension Service recommends an eight-year rotation with the first three years in cotton with winter legume crops grown between the cotton crops. The fourth year calls for a row crop; then pastures take over the last four years of the rotation.

In the Southeast, three- or four-year rotations are used on the steeper slopes, while two-year rotations are more common on level land. Recommended rotations for cotton farms:

1. A four-year rotation of cotton, cotton (or corn), and two years with small grain and lespedeza.
2. A three-year rotation of cotton, corn and small grain followed by a summer hay crop. Where tobacco is grown in rotation, a four-year rotation of tobacco, tobacco, small grain and red top is common.

More and more farmers of the Southeast are turning to Kudzu and Sericea lespedeza to protect their steep, badly eroded lands. When these crops are rotated with corn, corn yields are often increased four-fold. Both these crops make fine hay, when used in rotations three years or more in length. Oftentimes, a rotation of corn and Kudzu or Sericea is used on the steeper lands while cotton, small grains and annual lespedeza or crotalaria are rotated on the gentler slopes.

In the Southeast amazing results have followed the use of perennial grasses such as tall fescue, Bahia grass and Coastal Bermuda in rotations with row crops. In a paper presented during the Dallas meeting of the Southern Agricultural Workers' Association early in February, A. H. Veazy, SCS regional conservation specialist at Spartanburg, S.C., reports many such instances. Farmers say that growing perennial grasses and legumes in rotation with row crops has these advantages:

1. Higher yields.
2. Less erosion.
3. Less water runoff.
4. Less drouth damage.
5. Soil more friable.
6. Better drainage.

Let's look at some of these reports—

1. In 1952 E. L. White, Jr., of Whitesville, N.C., plowed up a one-year tall fescue sod. He planted one half of his tobacco on this land and the other half on land following tobacco. He says that the tobacco following fescue brought him $300 per acre more than the other tobacco.

2. At the Soil Conservation Station, Watkinsville, Ga., cotton following three years of tall fescue and ladino clover averaged, over a four-year period, 468 pounds of seed cotton per acre more than where cotton followed cotton.

3. In South Alabama big yields of corn, peanuts and other row crops have followed the turning of sod crops. Some 50 demonstrations of the practice in 22 South Alabama counties were put on last year. C. E. Culbreth, Houston County, Alabama, got nearly a ton of peanuts per acre following four years in Bahia grass. Bahia roots went 32 inches down into the soil. With a heavy June rain on the W. B. Anderson farm, Covington County, Alabama, there was no runoff where corn followed crimson and

Make Cotton Pay More in '54

Only Our Best Will Do

CAN WE AVERAGE a bale per acre over the Belt as a whole? We think so—but to do it we must sell the grower ALL approved production practices in a single "package."

TWO YEARS AGO Harold A. Young, then president of the National Cotton Council, suggested that an average yield of a bale per acre over the Belt as a whole appeared to be a reasonable goal.

At about the same time the results of a land grant college-USDA study were made public which showed that a Beltwide average of considerably *more* than a bale per acre could be obtained *if each grower would actually apply the practices recommended by his experiment station and Extension Service.*

And in March of last year, Director Claude L. Welch of the Cotton Council's Production and Marketing Division said: "With the aid of modern equipment, chemicals and the like, it is within reason to suggest that labor requirements will soon have been reduced so that one man will be producing 50 or more bales a season instead of the 15 or so bales typical of the present."

This is optimistic but, we believe, sound thinking. To predict that we cannot reach such a level of efficient production is to discount the capabilities of cotton's research and educational forces which did so much to bring about the phenomenal advances in cotton production techniques between 1940 and 1950.

A review of the progress cotton made in those 10 years leads us to suggest that only the most timid would dare to place a ceiling on what can *still* be done for cotton. But we recognize, too, that our accelerated progress toward a goal of a bale or more per acre for the Belt will be slowed down if we fail to apply steady pressure against the many problems that still stand in our way.

Higher acre yields more efficiently and economically produced should be the aim of every individual grower in this year of acreage controls. And it is the responsibility of ginners, crushers and all others who work with growers to encourage them to adopt all approved production practices in a single "package," rather than going all out on one or two and neglecting the others.

This special Better Production Practices issue was planned to spotlight the need for an appraisal by the grower of his whole philosophy of cotton production and to induce him to make full use of the recommendations of his experiment station and Extension Service.

Our authors, all leaders in their respective fields, have made this issue a veritable treasure house of information on practically every phase of our cotton program. If we are to give our best to cotton—and only our best is good enough—we must make this and other information available to the grower and help him to bring into focus all of the production practices that have been proved best in his own state and community.

If we can persuade him to adopt these practices in a single "package"—and discourage the piecemeal approach followed by so many growers—we will speed the day when a bale or more per acre for the Belt is a reality and not just an optimistic prediction.—Editor.

white Dutch clovers with Bahia, fescue and native grasses.

4. In Richland County, South Carolina, W. E. Allison made 120 bushels of corn per acre following fescue and ladino clover. "We don't need as much rain for corn where it follows crops such as fescue and ladino clover," he remarked. Allison's comment regarding the drouth resistance of corn following fescue and clover raises the question: Just how much soil and water are saved by good rotations?

Long-time tests at a number of experiment stations prove that such rotations are fine drouth insurance.

In a rotation of cotton, wheat and sweet clover near Guthrie, Okla., the average annual loss of soil per acre for a seven percent slope, was 4.2 tons. About 10 percent of the rainfall was lost by runoff. Compare these losses for the rotation as a whole with losses for individual crops in the rotation:

	Soil Loss (Tons)	Water Runoff (Percent)
Cotton	10.6	11.3
Small Grain	1.4	12.4
Sweet Clover	0.5	6.8

Tests at Statesville, N.C., with a 10 percent slope, also point up the reduction of soil and water losses made possible by rotations that include small grains and legumes:

	Soil Loss (Tons)	Water Runoff (Percent)
Cotton	23.2	9.9
Corn	30.2	10.3
Wheat	5.6	13.1
Lespedeza	1.6	3.9
Acreage for Rotation	15.1	9.3

Fine reports also come from farmers who have used Kudzu and Sericea lespedeza to protect and to improve their lands.

IN RECENT YEARS, the South has turned to rotations including perennial grasses as the best way to restore wornout lands.

1. From Greene County, Alabama, comes a report of 1½ bales of cotton per acre following Sericea. Other fields with similar soil conditions made three-fourths of a bale.

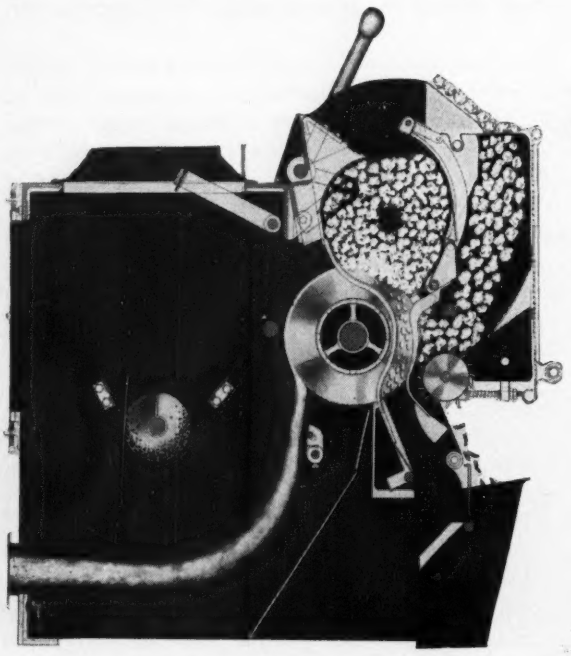
2. At the Raleigh, N.C., Conservation Station, it was estimated that Kudzu in a rotation of corn, oats, grain sorghum and Kudzu increased the corn yield 39 bushels per acre. Kudzu covered the land each year after the last cultivation of the row crops.

Just how valuable are such crops in saving soil and water?

At Watkinsville, Ga., on eroded sloping lands (about 10 to 12 percent slope) the average annual soil loss has been about a half ton of soil per acre in a three-year rotation of Kudzu, corn, oats and Kudzu. Annual runoff has been 5.8 percent. This compares with nearly 20 tons of soil loss per acre and 22.2 percent runoff on land where cotton was grown year after year.

Are we making progress throughout

(Continued on Page 85)



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Make Cotton Pay More in '54

"There have been more developments in equipment and mechanization practices within the past 10 years than in all the centuries that cotton has been grown."

A TWO-ROW cotton root slicer.

Cultural Practices for Cotton

By HARRIS P. SMITH

HARRIS P. SMITH is Professor of Agricultural Engineering, Texas A. & M. College, College Station.

WHEN COLUMBUS discovered the Western Hemisphere, he found cotton growing wild on the island of Guadalupe. Ferdinand Colon, son of Columbus, reported that "the cotton grows naturally about the fields like roses, and open of themselves when they are ripe, but not all at the same time . . ." Early Spanish explorers found that the Indians of New Mexico and Arizona were growing cotton on a well developed scale. Cotton breeders have, in recent years, identified several wild species of cotton growing in Arizona, New Mexico and in various parts of Central America.

The cottons grown in the West Indian Islands were perennial in growth characteristics and did not produce much fiber when cultivated. When the Lords Proprietors sent an expedition to settle on the Ashley River in South Carolina in 1669, the expedition stopped at the Barbados Islands and procured some cottonseed. After two seasons' trial in South Carolina, Joseph West, who became governor of the Colony, reported to the Lords Proprietors, "I feare this will not prove a cotton country."

The English spinners preferred East Indian cotton because the fiber was white, and wore white, while the West Indian cotton turned yellow.

When annual varieties were introduced from Cyprus and Smyrna in the early part of the 16th century, cotton culture in America became established.

During the first few years only a few thousand pounds were produced. The lint was pulled from the seed by hand. The production of cotton fiber was greatly handicapped by the lack of adequate machinery. Cotton could be produced in abundance, but the time, labor, and cost of getting a marketable product limited production. The invention of the cotton gin by Eli Whitney in 1793 removed this limitation, and cotton culture in the Southeastern States burst forth into a full grown industry two hundred years after the initial planting.

In the early culture of cotton, horse-drawn tools were used to prepare the seedbed, to plant the seed, and to cultivate the plants. The plow stock and crude cast iron moldboard plows were the principal tools. Animal power was used in breaking the land, planting and cultivation. Man power was used to drop the seed, thin the plants, hoe out the grass, and harvest the crop. The application of fertilizers was unknown until after the War Between the States. If there were insects, they were accepted as something sent by God and there was nothing the farmer could do about them, but let them chew.

As the years passed, men were thinking of new tools that would permit one man and a mule to handle more than 20 acres of land. Improved walking mule-drawn plows and planters were the first steps in the long road toward complete mechanization. After the walking tools came the riding plow and middle-buster, the riding planter and the riding cultivator. Tractors for breaking and bedding the land first came to cotton culture about 1910. But it was not until the advent of the row-crop tractor in the early 1930's that tractors were used extensively in planting and cultivating operations. Improvements in cotton culture tools have been rapid since the tractor became the main source of power on the cotton farm. In fact, there have been more developments in equipment and mechanization practices within the past 10 years than in all the centuries that cotton has been grown.

For example, during this 10-year period, 1943 to 1953, the following types of equipment and practices have been introduced and accepted by cotton farmers throughout the Cotton Belt:

1. Power operated stalk cutter-shredders dispose of crop residues.
2. The widespread use of the forward or centrally-mounted middle breaker.
3. The extended use of the rotary hoe in cotton culture.
4. The use of anhydrous ammonia as a fertilizer for cotton.
5. The use of chemicals for pre- and post-emergence weed control.
6. The adoption of narrow seed furrow openers and new types and methods of pressing the soil about the seed.
7. The adoption of the practice of planting cotton to a stand, thus reducing hoe labor by at least 50 percent.
8. The development of high-speed type sweeps for shallow cultivation.
9. The adoption of the touch control hydraulic lifts for tractor equipment.
10. The introduction and widespread use of organic chemicals for the control of insects.
11. The development of spraying equipment for tractors and airplanes.
12. The development and general use

of chemicals for defoliation of cotton plants as a pre-harvest operation.

13. The introduction and uninterrupted use of tractor-mounted mechanical cotton strippers.

14. The introduction of a successful mechanical cotton picker.

15. The extensive improvement of ginning equipment for the handling of hand-snapped and mechanically harvested cotton to produce high quality lint cotton.

The adoption and use of new or improved equipment and practices now makes it possible in some areas for farmers to perform all the operations required for producing a crop of cotton with almost no hand labor.

Nine Production Steps

Cotton mechanization in this year of 1954 has progressed to the point where the steps required to produce a crop of cotton can be divided into nine distinct mechanical operations. These are: (1) the disposal of last year's crop residue (old stalks), (2) land and seedbed preparation, (3) planting, (4) thinning, (5) weed control, (6) application of fertilizers, (7) application of chemicals to control insects, (8) application of chemicals to defoliate the plants prior to harvest, and (9) harvesting.

Only the first five of these steps will be discussed in this article. Discussions of the last four steps will be found in other special articles in this issue.

Crop Residue Disposal

Cotton farmers know that before they can start preparing the seedbed for next year's crop, they must first clean the fields. This means getting rid or disposing of any trash, such as old cotton stalks, corn stalks, sorghum stubble, dead grass and weeds. If winter cover crops have been grown, these must be disposed of before planting. In the early days of cotton culture, old stalks, grass and weeds were burned to get them out of the way. One of the big reasons why cotton farmers burned crop residues was because they did not have a tool that would do a good job of cutting and shredding the crop residue so it could be plowed into the soil. The burning of crop residue is now in disfavor, because soil improving practices show the need of returning all crop residue to the soil.

Crop residue disposal machines may be divided into several types, (1) the free-rolling trailing cutter, (2) the power operated beater, (3) the power operated radial knife cutter-shredder, and (4) the power operated horizontal knife cutter-shredder.

The free-rolling blade cutter does a fairly satisfactory job of partially cutting and breaking cotton stalks when they are dry and brittle. Where it is desirable to cut good size and fairly thick green cotton stalks, the free-rolling cutter does a poor job. Farmers in Northwest Texas and Western Oklahoma often do not complete the harvest until in December. The stalks are fairly small, dry and brittle. Farmers like to leave the stalks through January and February for protection against soil erosion by wind. Therefore, the farmers of this area prefer a shop built, five row, five section rolling cutter. A five row cutter operated at five miles per hour will enable the farmer to cover about 10 acres per hour or 80 to 100 acres per day.

There are several types of power operated beater and knife cutter-shredder machines available for disposing of crop residues. The power operated horizontal rotating knife cutter-shredder type is used extensively by cotton farmers throughout the Cotton Belt. Cutters of this type are available in two and four row sizes. Under favorable conditions 30 to 50 acres of stalks can be cut per day with the power operated cutter-shredder. The stalks are cut and shredded into pieces that can be readily plowed under.

The use of power operated stalk cutter-shredders, as soon as the crop is harvested, will reduce the overwintering population of most cotton insects. Many insects are killed in the cutting and shredding process.

For example, tests sponsored and conducted cooperatively by federal, state and other agencies, in August 1953, showed that 40 to 70 percent of the pink bollworm larvae were killed as the cotton stalks were cut with power operated cutter-shredders.

Wherever possible cotton stalks and other crop residue should be processed and plowed into the soil while green. Green material full of moisture will decay more rapidly than dry material. Some benefits that may be derived from the disposal of green cotton stalks and crop residue are:

1. Machines cut green, succulent materials better.
2. The chopped green vegetation decays faster than dry vegetation.
3. Better soil condition is obtained with green vegetation than with dry vegetation.
4. The maturing of grass and weed seed is prevented and future control measures are reduced.
5. Insects are destroyed before hibernation, thereby reducing next year's early insect population.
6. Winter cover crops can be planted

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SOIL mounted over the seed by covering shovels has a tendency to cause a soil crust to crack along the center of the row over emerging cotton seedlings.

directly folllowing disposal of the crop residue and better growth and benefits derived.

There is one other point that should be mentioned in connection with crop residue disposal. The best of the power operated cutter-shredders leave a stubble sticking up two to five inches above the ground. This stubble with extended tap roots makes a root-stubble a foot or more in length. Large stalks make a stubble more than an inch in diameter. When plowed out and left, this root stubble can cause a lot of trouble in planting, in the use of the rotary hoe, in the use of pre- and post-emergence chemicals, in cultivation by covering plants, and in harvesting.

"Root Slicer" knives, similar to peanut digger knives, run about 2 inches below the ground surface at high tractor speeds, will cut or slice cotton stubble into two pieces short enough to prevent them from giving trouble in mechanized operations.

Preparing the Seedbed for Cotton

The number of operations necessary to prepare a good seedbed is influenced by the thoroughness of crop residue disposal, soil type, topography of the land, power available, the type of machinery used, and the annual rainfall.

The amount of annual rainfall has more influence on the method of preparing the seedbed than any of the other factors listed. The Cotton Belt can be divided into two main subdivisions, the rain-grown areas and the irrigated areas. A line drawn from Oklahoma City, Okla., to Corpus Christi, Texas, about divides the Cotton Belt into dry land or irrigated cotton and the rain-grown cotton areas. West of this line the annual rainfall is generally less than 25 inches, while east of the line the annual rainfall is from 30 to 75 inches.

Throughout the Cotton Belt the seedbed is largely prepared by bedding the land with middlebuster type plows. In the rain-grown areas, the cotton is planted "on the bed" to obtain drainage, while in the dry farming areas of the West, the cotton is planted "in the furrow" to get the seed in moist soil and for protection against wind blown sand. Where irrigation is practiced, the land is bedded to facilitate furrow irrigation. Some cotton, where grown on sandy, well drained soils, may be planted on flat broken land.

The preparation of the seedbed for irrigated cotton requires more operations than are required for rain-grown cotton. In New Mexico, Arizona and California, the land is usually flat broken with two-way plows, after which it is leveled, disk harrowed, chisled, and in some cases smoothed again with an iron or wood float. Some farmers leave their land flat for planting, while others bed it as a last operation.

Planting Cotton

It is estimated that cotton farmers spend nearly a billion dollars each spring for seed, labor, and operating costs in planting 20-odd million acres of land. This does not include cost of equipment. Thus, it is seen that the planting of the cotton crop is expensive. Some farmers plant from two to three times before a satisfactory stand is obtained. A good stand obtained from the first planting makes a cotton farmer happy. There are many factors involved, any one of which could cause a poor stand of plants. For a good stand, favorable soil temperature, moisture in the soil, good seed and good coverage are the most important factors.

In former years agronomists recommended a stand of 12 to 15 thousand plants per acre after thinning. Now stands of 30 to 40 thousand plants per acre are recommended for good soils. Thick stands keep the size of the plant down so that mechanical harvesting machines, especially cotton strippers, can do a better job.

Where the cotton plants are unthinned and fairly thick, there are fewer bolls per plant. But since there are more plants to bear bolls, the yield is not greatly different than that obtained from thinned cotton.

To get good germination of cotton-seed, the soil temperature, where the seed will be placed, should be not lower than

(Continued on Page 57)

FLEXIBLE center rubber-tired press wheels on a planter firm the soil to hold moisture, which in turn helps germination. It also leaves the drill-row in condition for the application of pre- and post-emergence chemicals, the use of the rotary hoe and flame to kill young grass seedlings.

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"Under the framework of the 7-Step Cotton Program, results of research . . . are combined with results of farmers' ingenuity and are presented to cotton producers."

ONE OF THE Texas A. & M. College pickers being washed and serviced before going to the field. L. C. Eakin makes this a regular practice and finds it pays to keep the picker drum clean. In addition to washing the drum under high pressure each day, the entire machine is steam-cleaned once a week.

The 7-Step Program Leads to Better Balanced Production

By FRED C. ELLIOTT

COTTON PRODUCTION is in the process of undergoing a Beltwide revival. Because of new findings all along the line from producer to user, cotton is not the old "wornout" crop of the South. The crop offers a new and challenging frontier.

Mechanization alone is a challenge to the industry. Moderization of cotton gins to handle machine-harvested cotton is being achieved smoothly and quickly. Hundreds of scientists are now working with new cotton breeding techniques, new insecticides, new herbicides, and selective weed killers, new fungicides, new defoliants and new fiber laboratories—all of which are working toward lower costs of a better product for the consumer.

Cotton is by far the leading single source of cash income for farmers of Texas and gives work to a large bracket of its population. Normally the Texas crop accounts for about 40 percent of the nation's acreage and one-third of the production. The 1953 crop is valued at $752,186,340 for the lint and seed.

• **Educational Program**—A well-organized program is the answer to doing the Extension educational job with a crop this large distributed, as it is, over the entire state. Perhaps this actually results in an advantage rather than an unmanageable problem.

Following is the framework of the 7-Step Cotton Program under which the organized, Extension educational program of cotton production has been carried out for eight years: (1) Fit cotton into balanced farming; (2) Take care of the soil; (3) Act together on the best variety; (4) Make your labor count (mechanization program); (5) Control the insects and diseases; (6) Harvest and gin for higher grade; (7) Sell for grade, staple and variety value.

FRED C. ELLIOTT is Extension Cotton Work Specialist, Texas A. & M. College, College Station.

It is to be expected, therefore, that research with cotton would be a principal activity of Texas A. & M. and the cooperating federal research agencies. At the main station and at a majority of its 33 substations and field laboratories there are currently 35 active studies with cotton.

The findings of these research projects are of prime importance in carrying out the educational program on cotton.

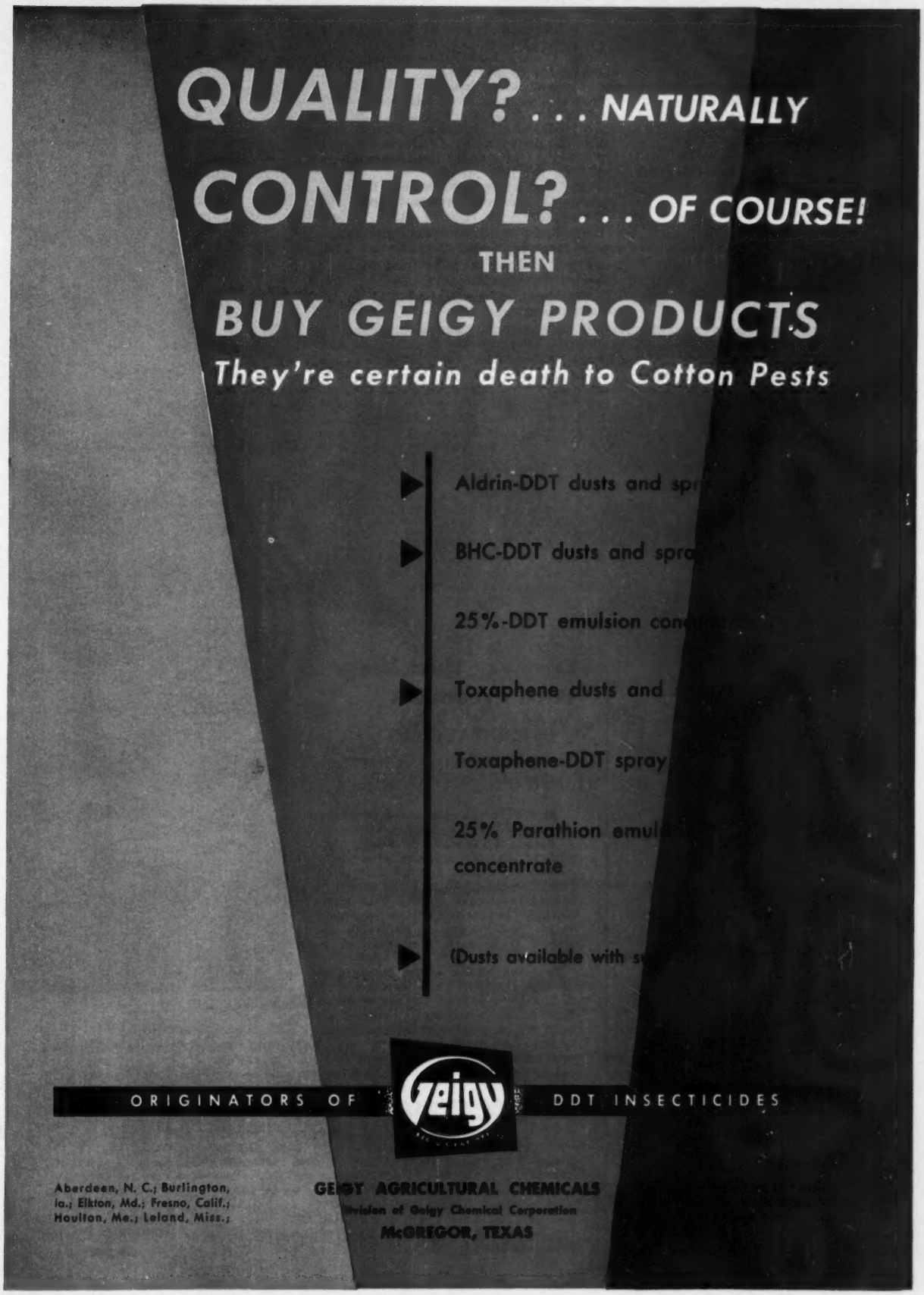
Under the framework of the 7-Step Cotton Program the applicable results of research work on cotton are reviewed, assembled, organized, combined with results of the farmers' own ingenuity and presented to producers by specialists and county agents of the Extension Service.

In doing this job, the cooperation of all agencies in a position to help has been obtained. Also, the allied interests, including ginners' associations, oil millers, insecticide and fertilizer dealers, machinery and implement dealers, bankers, newspapers, farm organizations, and radio farm directors, have actively supported the program on a state as well as county level.

A county 7-Step Cotton Committee, composed of these key people and leading cotton farmers and farm organizations, has been organized in each of the major cotton growing counties by the county agent. This group carries out the program in the county, thus insuring organized activity on a county and community basis.

Many bulletins, leaflets, circulars, blueprints, circular letters, and news letters are prepared at the college and supplied to the county agricultural agents. Also regular district and county-wide meetings are held at which time the latest findings are given.

Pictures for up-to-date colored slide sets are taken continuously, assembled and placed in the visual aids library for the use of county agents in conducting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timely meetings throughout the year.

As a measure of success, the adoption of increased efficiency in cotton farming practices has been responsible for the 41 percent average gain in per-acre yield of cotton in Texas during the past 10 years over the previous 10 years.

The two most expensive bills against the farmer's cotton crop are the harvesting bill and the hoe bill. Let's take a look at the progress made on these two items since the 7-Step Cotton Program was introduced in 1946.

• **Mechanical Harvesting** — During the last seven years the progress in machine harvesting has been as follows:

Year	Spindle Pickers	No. of Counties Where Used	Strippers	No. of Counties Where Used
1947	19	—	3,443	—
1948	92	23	4,523	61
1949	335	69	7,003	84
1950	255	63	7,138	72
1951	767	72	14,127	109
1952	1,122	74	14,270	119
1953	1,557	83	15,088	130

Approximately 19 percent of the 1951 crop was harvested mechanically, 22 percent in 1952 and nearly one-third of the 1953 crop was harvested by machines at one-third the cost of hand harvesting. Roughly this means a saving of $36,250,000 to Texas cotton farmers.

In Texas we find mechanical pickers are operated in the Lower Rio Grande Valley, South Texas, along the Gulf Coast, through the Blackland section (river bottoms in particular), Red River Bottom, Pecos and El Paso areas, while the stripper is particularly well adapted to the High and Rolling Plains and the uplands of Central Texas.

• **Rotary Hoes**—The rotary hoe was first mentioned and recommended in a 7-step cotton meeting in Texas at Lubbock, in 1946. The rotary hoe tractor attachment is now being widely used, and cut the hoe bill about 65 percent for its users in 141 counties last year.

The progress of this practice has been as follows:

Year	No. of Rotary Hoe equipped tractors	No. Counties
1949	6,966	81
1950	10,004	97
1951	19,467	111
1952	25,977	133
1953	26,804	141

• **Chemical Weed Control** — Chemical grass and weed control is just getting under way in Texas and the extent of this practice the last two years has been as follows:

Year	No. Acres Pre-emergence Treated	No. Counties	No. Acres Post-emergence Oiled	No. Counties
1952	7,754	36	2,303	10
1953	11,036	39	7,410	21

Let us suppose that a new cotton production practice is ready for release. The research data look good, the results from the field trials are satisfactory and the techniques for use have been worked out and the new practice is ready to give the grower. How do we get the information to the farmer quickly and effectively?

• **Getting Facts to Farmers**—Following is a plan for making the research and education mean something to the cotton farmer:

(1) The research workers and Extension specialists concerned get together and decide whether they have all the answers and the new practice is ready for recommendation.

(2) A new bulletin is written and sent to the county agent.

(3) A colored slide set is assembled from the pictures available and placed in the film library.

(4) Magazine articles, along with suitable pictures, are published early in the year in leading magazines interested in the new idea.

(5) Circular letters are sent to county agents and news letters to over 600 newspapers.

(6) Radio programs are given and tape recordings sent to radio stations.

(7) TV shows may be used to show the new farm practice.

(8) Meetings are called and information presented.

(9) Commercial companies selling the materials and equipment advertise and stock the items for sale.

Thus, the know-how, materials and equipment for a new practice, such as lateral oiling of cotton for grass and weed control, can be released. The information can be made available on one practice in several ways very quickly.

Therefore, the results of modern research and education will no longer stay on the shelf to collect dust but will flow to the user as soon as proved ready.

■ **GENE HOOD has joined the Arkansas-Missouri Cotton Ginners' Association as a contact man and is in the field working with members.**

State Supervisors To Aid Insect Reporting Work

A more effective insect pest reporting service for farmers is expected to result from the work of full-time state insect survey supervisors sponsored jointly by USDA and state agricultural agencies. Supervisors are already at work in seven states and should soon be on the job in several others.

The first cooperative federal-state insect survey supervisor was appointed in Missouri, July 1, 1953. Since then, similar posts have been filled by USDA and the states of Maryland, Texas, Arizona, Utah, Louisiana, and Florida.

Full-time supervisors in the states are expected to increase the flow of timely and valuable information about impending insect outbreaks and the discovery of new or dangerous insect pests. By strengthening insect reporting, entomologists hope eventually to provide farmers with as much immediate, accurate information on insect conditions as they now get on weather.

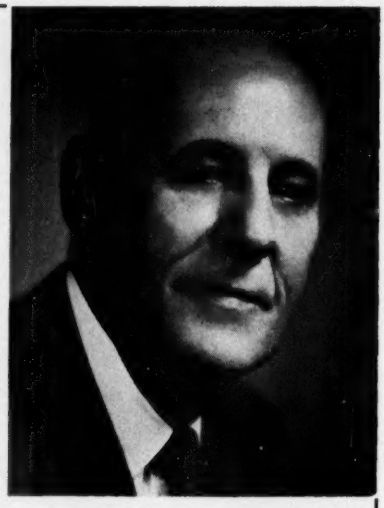
Grasshoppers Are Threat

New Mexico, Texas, Oklahoma, California, Nevada, Utah, Oregon, Montana, Wyoming and Kansas are expected to have grasshopper infestations ranging from light to heavy, entomologists report. Northeast New Mexico and adjacent areas of bordering states contain the largest potential infestations of range land grasshoppers.

Crushers Must Work With Producers

By S. J. VAUGHAN

President, National Cottonseed Products Association

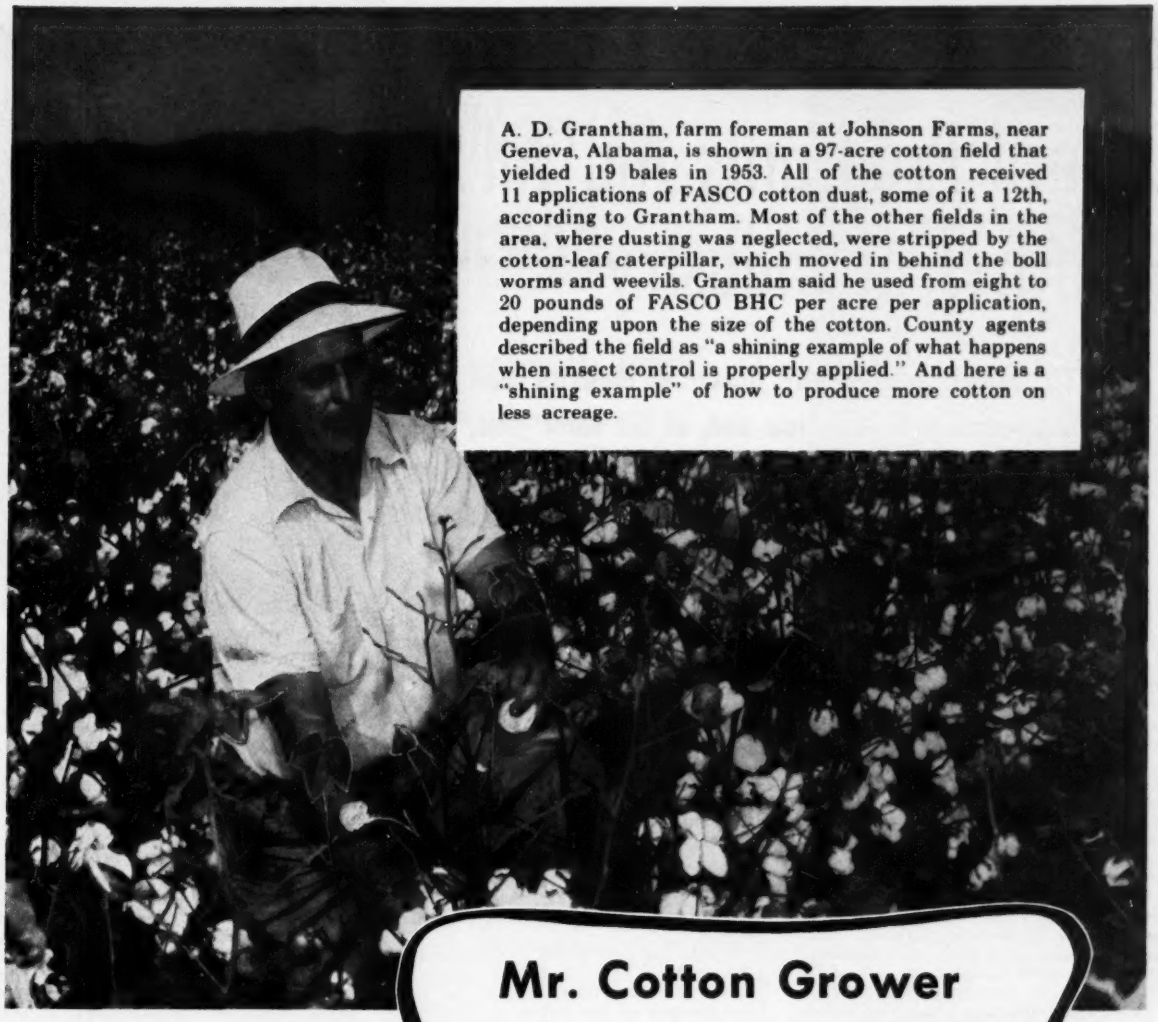


■ WITH the cottonseed crushing industry facing a drastic reduction in cotton acreage, it is vitally important that the industry as a whole —each state unit and all interested committees as well as individual mill operators—works closely with agricultural leaders and cotton producers to see that maximum yields are obtained from each acre planted in cotton.

In communities where better production practices have been followed, it has been proven beyond a doubt that cotton producers adopting all such practices as a package definitely have had much greater per acre yields and likewise greater profits than producers adopting only one or two such practices.

I know of no better way for the cottonseed crushing industry to render a great service to itself and to the producers of cotton than to take the lead in encouraging cotton farmers to adopt all of the production practices that have been proven profitable.

The cotton oil man occupies a key position both in his community and in the agricultural world. Fortunately, there are many who realize the importance of proper planting and cultural methods, insect control, and proper harvesting methods and are doing something about it. Every crusher has a responsibility to promote increased use of these better production practices through agricultural committee work, and discussions with farmers and ginners, and by working closely with those agents who are responsible for developing the best possible practices for the production of cotton and cottonseed.



A. D. Grantham, farm foreman at Johnson Farms, near Geneva, Alabama, is shown in a 97-acre cotton field that yielded 119 bales in 1953. All of the cotton received 11 applications of FASCO cotton dust, some of it a 12th, according to Grantham. Most of the other fields in the area, where dusting was neglected, were stripped by the cotton-leaf caterpillar, which moved in behind the boll worms and weevils. Grantham said he used from eight to 20 pounds of FASCO BHC per acre per application, depending upon the size of the cotton. County agents described the field as "a shining example of what happens when insect control is properly applied." And here is a "shining example" of how to produce more cotton on less acreage.

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All Formulations—
Dusts and Sprays

The cotton pests are coming again this season—the boll weevil, boll worms, thrips, aphids, leafworms, flea hoppers, red spiders, and a host of other enemies.

Your best ammunition against these costly enemies is FASCO quick-action pesticides. FASCO's quality "poison" dusts and sprays embody the old and the new of the most powerful insecticides known to modern science. Easy to apply, economical to use, quick to act.

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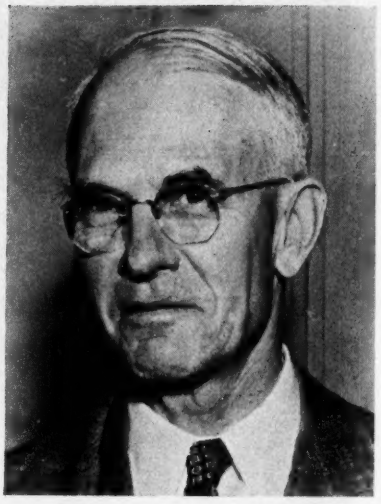
GENERAL OFFICES: JACKSONVILLE, FLORIDA

Make Cotton Pay More in '54

Council Programs Aid All Branches of Industry

"To compete successfully, the cotton industry must keep production costs low and, at the same time, must yield a superior raw product."



A. L. DURAND is President, National Cotton Council, and President, Chickasha Cotton Oil Co., Chickasha, Okla.

By A. L. DURAND

THE CONSUMER won't buy cotton and cottonseed products if he can buy others that will do his job just as well for less money.

Nobody realizes this better than the National Cotton Council. To compete successfully, the cotton industry must keep production costs low and at the same time yield a superior raw product.

And attractive price tags on superior products demand low production costs.

These simple, vital facts led the Council—almost at its inception—to establish a program that would increase efficiency and lower costs of production, keeping cotton competitive while giving the producer a reasonable return on his investment.

This has grown into what now falls within the scope of the Council's Production and Marketing Division, maintaining broad programs on mechanization, insect control, fertilizer use, defoliation, and lint quality preservation.

Careful attention is given to planting, cultivation, harvesting, ginning, and marketing with emphasis always on building inherent quality in lint and seed and maintaining that quality every step of the way from farm to market.

Industry leaders throughout the Belt have stated that this portion of the Council's program is playing a major part in boosting production from the man-and-mule era to higher and higher levels of machine efficiency.

How does the Council approach this task which grows steadily each year in scope and complexity?

Cooperation Is Key

The key word transcending its entire philosophy is *cooperation*; cooperation with every segment and group in a great American cross-section for the attainment of a common goal: greater consumption of better cotton and cottonseed products.

Commercial firms, agricultural public employees and members of the great cotton industry all work toward this goal. But often—in absence of close working relationships—they have duplicated efforts and otherwise suffered because of lack of awareness of one another's problems.

The Council acts as the cohesive agent for these groups, pulling them together so each can benefit from the other, thus facilitating progress toward production efficiency.

For instance, at annual Council-sponsored Beltwide cotton insect control conferences, commercial chemical representatives learn at first hand the problems of cotton farmers in controlling insects that beset the cotton crop.

They learn these, not only from the cotton producers, but also from highly trained technicians of the U.S. Department of Agriculture, Experiment Stations, and state Extension Services who are employed to recognize production problems and work toward their solution.

The same is true of mechanization, weed control, defoliation, fertilization, general quality improvement, and fire prevention.

Within our land-grant colleges and the USDA there is a system of farm research and education created to serve the interests of the nation generally, as well as the particular interests of agriculture.

Because it has become obvious that this system needs strengthening if progress in agriculture is to keep pace with progress in the rest of the economy, staff members of the Council's Production and Marketing Division even now are cooperating with workers from federal and state Extension Service, and from many farm organizations, in preparing basic guides for an expanded agricultural extension program.

Inherent in these guides is the idea of bringing research and educational programs of the USDA and the land-grant colleges more adequately to grips with problems of farmers.

These plans envision an adequate staff of farm advisors to work under each county agent in helping individual farmers make profitable application of the results of research to his own farm.

And so it goes. The Council's role in the panorama of better production practices has been that of cooperator and stimulator since 1939.

Council staffers who constitute the hub of these coordinating activities are especially trained to work intelligently with the various segments on production problems. They include men who have spent the greatest part of their lives in cotton research, coming to the Council from responsible positions in government, education, and industry.

They talk the practical language of the cotton farmer and the technical language of the seed breeder, the farm equipment manufacturer, the farm chemical representative, the processor. And they work closely with other Council departments to tell the story of this work where it will do the most good.

Through the Council's office of public relations, information gathered from all quarters of the industry is distributed. This part of the program has fallen into a pattern of carefully organized campaigns of news releases which are routed to farm publications, Extension editors, cotton specialists, the daily and weekly press and to radio farm directors throughout the Cotton Belt.

The campaigns include seed cotton handling, fire prevention, insect control, mechanization, defoliation—every phase of cotton production.

Progress is difficult to measure on a year-to-year basis. But an increase in the amount of cotton produced from a given amount of resources, an increase in yields, and in the productivity of labor, represent evidence of progress at least.

Unquestionably, the most dramatic change in cotton production since the Council was first organized in 1939 occurred when cotton growers started swapping mules for machines. And the machine that has soared into prominence most spectacularly is the cotton harvester.

"In 1949, the mechanical picker was little more than a remote hope. Its commercial development didn't really begin until about 1946. But since that time, the number of these machines on cotton farms has zoomed up to over 12,000," according to Claude L. Welch, director of the Council's Production and Marketing Division.

During the same period there has been a phenomenal increase in the number of stripper-type harvesters. Some 20,000 or more strippers may be found today on Cotton Belt farms.

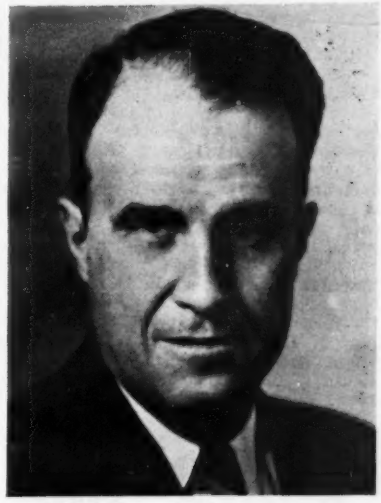
Indeed, there are enough pickers and

(Continued on Page 54)

Make Cotton Pay More in '54

Adaptation of Cotton to Mechanical Production

"Pressure on plant breeders to modify the cotton plant to suit machines is increasing. Cotton breeders have a real responsibility and they are trying to live up to it."



By T. R. RICHMOND

T. R. RICHMOND is Agronomist, USDA-Texas Agricultural Experiment Station, College Station.

IN COTTON PRODUCTION, as in other industries, "mechanization" describes the process of utilizing machines for work formerly performed by men and animals. Beginning with the cotton gin, invented toward the latter part of the eighteenth century, suitable machines have been developed for one production phase after another. Now only weeding, thinning and harvesting operations require any considerable amount of hand labor, and these operations are fast yielding to the machine. There seems to be little doubt that the trend toward full mechanization of cotton will continue.

That the operations of weeding, thinning and harvesting have been the last to respond to mechanization is not surprising, in view of the fact that to reach maximum efficiency they require not only the greatest precision but also the operator's ability to exercise judgment. Lacking the power to think, the mechanical hoe can not "even out" a skippy stand. Nor can the mechanical picker be expected to gather the open cotton without missing some bolls, dropping a few locks or at least leaving a certain number of "tags." However, the agronomist and the engineers already have demonstrated that, under carefully planned and controlled cultural systems, machines, with all of their deficiencies and imperfections, often can be used for these operations with greater total economy than can hand labor.

• **Breeders' Help Sought**—As each new machine or mechanical principle reaches the stage of practical application, the cotton breeder nearly always is asked if he can't do something to the plant to make it better adapted. On occasion, engineers and others in the field have asked us to produce plant and boll types which would require a combination of characters far outside the present range available in our cultivated cottons. Some of the specified combinations are even biologically antagonistic. Such requests may have been prompted, at least in part, by some rather extravagant claims on the part of a few cotton breeders, some of whom have gone so far as to say, "tell us the kind of cotton you want and we will produce it for you."

A plant breeder who sticks with his job very long must be inherently optimistic; he will not admit anything is impossible. But the responsible cotton breeder will be guided by his science and will not promise more than the nature of the problem and the breeding material at hand would indicate. Remember that cotton is biological material in which all characters, especially those of economic importance in our present agricultural varieties, are in a state of equilibrium or balance. This is a result of many years of selection and testing. Minor changes in one or more characters may be made without greatly disturbing this balance; but when drastic changes are attempted, the equilibrium is disrupted and a new balance, if attained at all, will require many additional years to develop.

• **How Cotton Grows**—Characteristically, when a cotton seed germinates the young root pushes out of the seed coat first. This root grows rapidly and becomes anchored in the soil. All the while, the stem portion of the seedling has been lengthening and pushing upward to form an arch or "crook." Great pressure is exerted in this arch, causing the stem with the two cotyledons or seed leaves (which also have enlarged rapidly) to be lifted above the ground. As the plant grows it forms nodes or "joints." At each node there are buds which may develop into leaves and branches—and from the branches, bolls. The typical mature plant has a central stem from which side branches grow in a more or less horizontal position. These are called the fruiting branches. The plant also may put out one to several branches at or near the base of the plant which grow upward at an angle approaching 45 degrees. These are popularly called limbs or vegetative branches. Since they, in turn, bear fruiting branches, they are morphologically identical to the central stem. The fruit forms, or "squares," occur at the fruiting branch nodes. They are produced in a regular sequence. If we ignore shedding of any kind, we find that the time interval between the appearance of the first bloom on the first fruiting branch and the first bloom on the second fruiting branch is some three to five days while the interval between the first bloom and the second bloom on the same fruiting branch is about six to eight days. Following this sequence on a plant, we see that the fruiting pattern moves upward approximately twice as fast as it moves outward. As a farmer friend so aptly put it, "she joints and squares." To produce a satisfactory crop the plant must fruit over a considerable period of time. We call this an indeterminate fruiting habit as contrasted with the determinate habit of the sorghum plant which produces a single head at the top of each stalk. Another important characteristic of the cotton plant is the abscission layer which forms at the base of leaves and young bolls during adverse periods of growth, causing them to "shed." Because of its indeterminate habit of growth and its ability to shed, cotton is adapted to a wide range of growth and environmental conditions. As we shall see later, these characteristics can be both advantageous and disadvantageous when we approach the problem of breeding for adaptation to mechanization.

This picture of growth and development is only a rough generalization of the type of material with which the breeder has to work. Thicker stands, chemical applications, insect and disease damage, as well as genetic changes brought about by plant breeding methods, can cause the picture to be changed appreciably but the main principles will hold throughout.

Weeding and Thinning

New tractor-mounted tools, such as the special adaptation of the rotary hoe which uproots seedling weeds and at the same time permits high-speed cultivation of young cotton, have greatly advanced mechanical weed (including grass) control. Pre- and post-emergence chemical applications are now receiving a great deal of attention. Two general approaches are being made to thinning problems. One is the attempt to obtain thick, but even, stands which can be chopped mechanically (or perhaps spaced with a chemical) without danger of producing big skips. The other is an attempt to plant to a stand that requires no thinning. Both seem to have a place in mechanical production, depending on

the nature of the soil and other cultural conditions.

In only a few cases has a specific or direct attack been made on weeding and thinning problems by plant breeding. One case is the testing of various strains for resistance to herbicidal oils at the Mississippi Delta Branch Station. Certain lines extracted from a species-hybrid have shown promise; but of course it remains to be seen whether a significant degree of resistance can be incorporated into an economically acceptable variety. For the most part, the plant breeding contribution in this field has been of a general nature. Although little direct selection pressure has been placed on such characters as seedling vigor, and cold, disease and insect resistance, these characters probably have been up-graded during the process of breeding present-day varieties. These characteristics take on a new importance when the weeding and thinning operations are to be handled mechanically. Much more breeding work needs to be done on the seedling characters just mentioned.

Harvesting

The trend in the development of harvesters has been to design machines to simulate the operations as they are performed by hand. Consequently, cotton harvesting machines are of two main types: (1) the picker, which removes the seed cotton from the open boll with spindles; and (2) the stripper, which removes both the seed cotton and the bur in a manner roughly comparable to hand snapping or "pulling."

Ordinarily the picker is used in areas of relatively high rainfall and a long growing season where the plants grow tall and produce an abundance of foliage. Mechanical picking (at least the first time over) is nearly always performed before frost. Often the first mechanical picking is made while leaves are still green and before all bolls are mature and open. Stripping, on the other hand, is a "once-over all-over" operation and green bolls that may be present are removed along with mature bolls. When either operation is performed before frost, it is a common practice to remove green leaves with a chemical defoliant which, directly or indirectly, acts on the abcission layers of the leaves. Much remains to be learned before defoliation can be brought under the desired degree of control. The chemist and plant physiologist are hard at work on the problem. Since it has been demonstrated that cotton varieties vary in response to defoliants, it is possible that the plant breeder may be able to help. One major difficulty has been the large number of variable factors which contribute to the total problem. Until more control of several variables can be developed, it will be almost impossible to isolate the necessary primary breeding stocks.

Fortunately, several rapid fruiting, early maturing American upland varieties developed during the past 20 years are fairly well adapted to mechanical picking, particularly when grown under planned systems of spacing and culture. Future work is being directed along two lines: (1) the achievement of more efficiency, i.e., obtaining a higher percentage of cotton harvested as compared to the total available open cotton on the plant, and (2) obtaining raw lint cotton equal or superior in grade and other qualities to that of hand-picked cotton, i.e., freedom from leaf, stem and bract trash and other foreign matter, and with a minimum of discoloration and staining due to exposure to weather and to insect and disease damage.

If a number of qualified persons were asked to give a set of specifications for an "ideal" type for spindle picking the general opinion probably would favor a plant (1) that will have a strong central stem anchored by a well developed root system, (2) that will be early in fruiting habit and fairly determinate in growth habit, (3) that will set its fruit in an evenly spaced pattern all over the plant, but beginning well off the ground, (4) that will have fluffy bolls and at the same time have locks which stick in the bur strongly enough for good storm resistance, (5) that will mature its fruit early and in a very short time, and (6) that will have a minimum of small leaves which will shed readily (from natural causes or as a result of chemical applications) when a major portion of the bolls have matured. Even a casual consideration of such an "ideal" plant will reveal several genetic, physiological and morphological antagonisms. Several of the factors are interrelated.

The stiffness of the central stem and root system received little attention from breeders until recent years. Now breeders across the Belt realize the importance of these characters and are taking them into account in appraising new selections. However, the law of gravity has not been repealed; and under the conditions of a heavy crop of green bolls set well off the ground, the plant is likely to lean. If the footing is soften-

(Continued on Page 51)

COKER 100 WILT COTTON

Picking 100 boll samples in a Coker cotton breeding nursery at Chester, South Carolina

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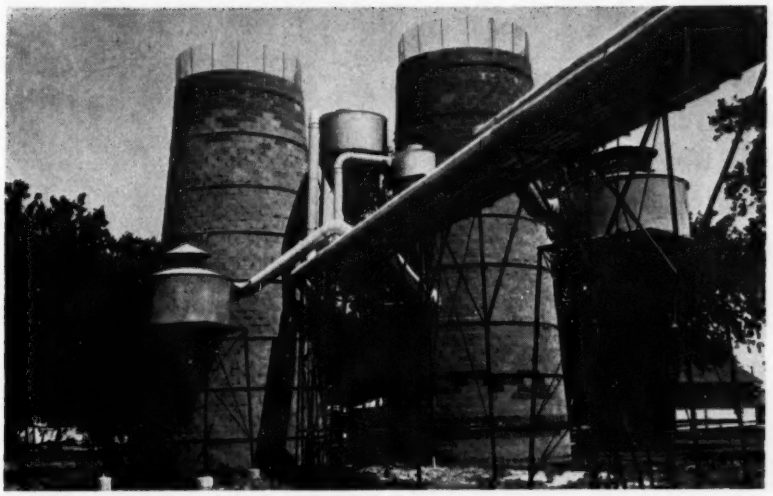

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Above: Burner at Legg Gin Co., McGregor, Texas, B. J. Allen, owner.

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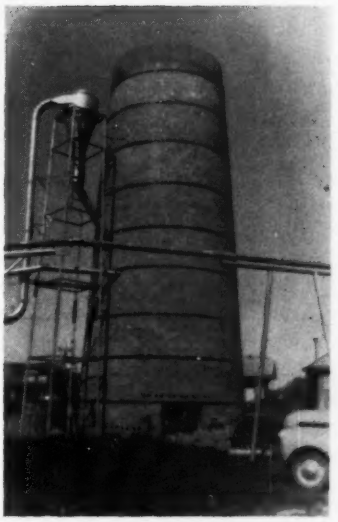

Burner above is at F. B. Lam Gin Co., Oglesby, Texas—handles a 5-80 outfit.

These burners can also be used for disposals at lumber mills as well as for various other commercial uses.

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Make Cotton Pay More in '54

Mongrels vs. Purebreds

"Great progress has been made by cotton breeders . . . Varieties that have been developed in recent years give superior performance when used in their area of adaptation and when all of the best approved cultural practices are followed."

By C. C. MURRAY

C. C. MURRAY is Dean and Director, College of Agriculture, University of Georgia, Athens.

"LIKE Begets Like" is an ancient truism. It is observed in daily life by everyone. People accept it and believe it. Yet it is forgotten or overlooked in too many cases. It is appreciated and put into practice by livestock farmers perhaps to a greater extent than by cotton growers. It is of equal importance to both.

Great progress has been made by cotton breeders in the development of excellent varieties. Varieties that have been developed in recent years give superior performance when used in their area of adaptation and when *all* of the best approved cultural practices are followed.

All of the Agricultural Experiment Stations in the Cotton Belt have cotton breeding and varietal performance tests. This work, along with the fine breeding and testing programs conducted by commercial seed companies, makes information available to growers on the best varieties to use in the different areas of the Belt.

Most of the states have a crop improvement association, the members of which produce planting seed according to approved standards. This fine work and information which is available in each county of each cotton growing state should be used by every cotton grower.

• **Why Use Good Seed?**—The question might be asked: What are good seed and why is their use so important? First, good seed have the proper breeding back of them so as to insure high yields of good quality cotton. The length and uniformity of staple, fineness, strength and mill performance have been greatly improved by breeding and testing programs. This is reflected in the improved quality of our cotton crop.

Second, good seed are sound and have high germination. We must therefore not only use seed of varieties of proven performance and mill acceptance but planting seed must be produced, stored, processed and merchandized in such a way as to provide high germination. Unless seed have high germination a satisfactory stand cannot be obtained. This is of utmost importance.

No farmer ever made money off of a skip! He must have sufficient plants to utilize the row space and plant nutrients and to produce sufficient bolls to make a good yield. Growers should consult their county agent relative to the best row width and spacing to use because this varies, depending upon local conditions. They should then plant seed at a rate based on the best spacing and the percentage germination of the seed that will provide sufficient plants to produce high yields.

Generally speaking there is a close relation between the number of good, strong and healthy plants per acre and the yield. Spacing tests at Experiment Stations and results obtained by many growers show that the highest yields are produced by using 25,000 or more plants per acre. This number can be obtained by having two to three plants per hill about 12 inches apart in rows 36 to 42 inches wide. Good seed of high germination are necessary in order to get this number of plants well distributed over an acre.

Third, good seed are clean and free of lint, weed seed, and foreign material. It is important that seed be in such a condition that they will flow evenly through the various types of planters that growers use.

Modern planters are now in use which will distribute in the way desired, that is, distribute evenly in the row or drop in hills. In recent years considerable use has been made of hill dropper planters. The two main reasons for a hill planter are that it saves labor and expenses in chopping and also reduces the number of seed necessary to plant an acre. Most hill dropper type planters require the use of delinted seed. If normal fuzzy seed are used, they tend to cling together and are not placed uniformly in hills by hill dropper planters. Where delinted seed are used, all extraneous lint and other types of foreign materials are removed in the delinting process. Most planting seed are delinted by the use of acid or reginning.

Most Experiment Station tests and the experiences of growers indicate that it is desirable to use delinted seed. Consequently, most of the seed prepared for planting purposes is now delinted by one of the two methods mentioned above.

Fourth, good seed are free of disease organisms which if present may rot the seed before germination or kill the young seedling. To protect against damage from seed borne diseases the practice of treating planting seed is almost universally followed. This is a good practice.

Fifth, most of the present day varieties have been bred to resist certain diseases. This is particularly true in the case of wilt. There are several kinds of wilt, one or more of which are prevalent in most sections of the Cotton Belt. This disease used to be confined largely to the light, sandy soils of the Coastal Plain areas. It is so widespread today that, with few exceptions, it is wise to plant seed of varieties which carry sufficient resistance to avoid or minimize the possible damage from this disease. Seed and soil treatments will not protect a cotton crop. The use of resistant varieties is the only practical control. Such varieties are available for all sections of the Cotton Belt.

Through Experiment Station tests and farmer experiences the most favorable date for planting is known in each locality. If the farmer fails to get a good stand or has to replant his crop, he will likely experience low and unprofitable yields regardless of the application of other factors that may be favorable to a profitable crop. Hence, it is difficult to over-emphasize the importance of planting good seed. The use of good seed in its broadest sense might be regarded as the **First Commandment** in successful cotton production.

• **Recipe for Success** — The following recipe should be helpful:

1. Select good land for the crop and prepare it well.
2. Select seed of high germination of an adapted variety, plant and fertilize according to the recommendation of your college of agriculture. Farmers who produce and save their own planting seed should keep in mind the importance of the points brought out above. They should have their seed processed and prepared for planting in such a way as to maintain varietal purity and high germination. Seed should be delinted and treated. Farmers who purchase their planting seed should obtain them from good, recognized sources. For example, they should be obtained from a recognized breeder or from a member of a crop improvement association who produces certified seed.
3. Keep the crop clean of weeds and grass by using the best methods available.
4. Control insects by checking on infestation and applying insecticides according to recommendations of your college of agriculture.
5. Harvest the crop in the most efficient and economical way to preserve quality.
6. Make an all-out effort to improve the quality of your crop and cut costs.

Make Cotton Pay More in '54

Fertilizer Requirements In Cotton Production

"With continued improvement of cultural methods and development of adaptable and economical machinery, the cotton producer can further reduce his costs."

By MALCOLM H. McVICKAR

COTTON GROWING is no longer "one mule and Negro" farming. The advances being made in cotton production are setting a pattern of efficiency—a pattern which will lead to a sounder agriculture. Just look at what's already happened. Only a few years ago, it required approximately 250 man-hours to grow and harvest a bale of cotton. Today, labor requirements have been reduced as much as 90 percent, when all phases of production are mechanized.

Reducing costs and increasing yields in cotton production are complementary and play a major role in cotton's fight to maintain its place in the textile world. The battle is far from lost. With continued improvement in cultural methods and the development of adaptable and economical machinery, it is evident that the cotton producer can further reduce his production cost.

MALCOLM H. McVICKAR is Chief Agronomist, The National Fertilizer Association, Washington.

The National Fertilizer Assn.

FERTILIZER made the difference here. Cotton on left received no fertilizer. Well-fertilized cotton on right produced much greater yield.

Any way you look at it, our ever-increasing knowledge of cotton nutrition —how more cotton can be grown per acre—offers the real opportunity in reducing unit production costs and increasing profits. We'll have more to say about yields and profits later. First, however, let's look back and see what has happened as to cotton fertilization.

Back in 1927, an average of 94.9 pounds of fertilizer per acre went on cotton. The average yield for that year was 145.7 pounds. By 1938, farmers had upped their fertilizer usage to an average of 120.1 pounds of fertilizer per acre, and the acre yield had climbed to 238.7 pounds. The year 1950 saw 203.3 pounds of fertilizer going on cotton. The average harvest in 1950 amounted to 264.9 pounds per acre.

The rate of fertilization on cotton is still increasing. Currently, each acre going into cotton receives on the average about 210 pounds of fertilizer. This 210 pounds of fertilizer is equivalent to approximately 55 pounds of plant food—nitrogen, phosphoric acid (often referred to as phosphate), and potash. To some people, this rate of fertilization may seem high; yet it is far below the amounts recommended by our agricultural colleges.

The 1953 average cotton yield was estimated on Nov. 1 at 325 pounds per acre. This means that the cotton crop removed from each acre approximately 43 pounds of nitrogen, 17 pounds of phosphoric acid, and 35 pounds of potash —a total of 95 pounds. In other words, the natural plant food content of our cotton acres still is being mined.

Acreage Allotments Need Not Cut Income

Controls mean that this year's acreage will be reduced to about 21 million acres —quite a drop from the 25,284,600 cultivated acreage in 1953.

What does this all add up to? It simply means that the cotton grower will have fewer acres, and his income will drop unless he increases his profits per acre. Fortunately, this can be done.

Many hundreds of experiments and

literally thousands of farm demonstrations have shown that the key to high profits is high per acre yields. The reason for this is that in this day of mechanization, it costs almost as much to grow and harvest a puny crop as it does to produce a bumper crop. Thus, the extra pounds of cotton come at a low cost.

Some people think that an increase in yield per acre simply cancels out the effects of an acreage reduction. This is not necessarily true. For example, consider the case of the cotton farmer who makes a profit of less than $25 per acre by raising an average cotton crop. A slight increase in yield can more than double his profit. Thus, this farmer would actually make more money by cutting acreage in half, taking better care of the crop, and harvesting more lint per acre.

Nutrition Is the Key

Big yields—really profitable yields—can come only from well-fertilized fields. Throughout its life, the cotton plant must have at its disposal ample plant food in proper balance. Experiment stations in every cotton state have data showing that the wise use of fertilizer on cotton pays, and pays well. Here are a few typical examples: In South Carolina, the use of 800 pounds of fertilizer resulted in an increase of $47.32 per acre; in Texas, where 400 pounds of fertilizer were applied per acre, net returns over fertilizer costs amounted to $13.38; in the Mississippi Delta, an application of 40 pounds of nitrogen in a three-year test increased the yield by 164 pounds of lint and by 314 pounds of seed per acre, amounting to an increase in profits of $51.19 per acre.

The story is the same wherever you go, but there is more to fertilizing than just putting on pounds per acre! To get the most from the fertilizer dollar, the cotton farmer must use the right fertilizer and apply it in the proper manner. This brings up the question, how can the cotton grower determine what kinds and how much fertilizer he should purchase? The answer is simple! Have his soil tested. Most of our agricultural colleges maintain testing laboratories where qualified technicians test soil samples for the natural plant food content of the soil and make fertilizer recommendations for increasing its nutrient level sufficiently to produce profitable crops.

A word of caution—a soil test report from an improperly taken sample is worse than no test at all. Before sampling his field, the farmer should contact his county agent and obtain definite instructions on how to take and prepare his soil samples, and where to send them.

The Follow-Through

Soil test results and recommendations mean nothing unless they are put into effect. The farmer must follow the recipe given by the college authorities if he is to "cash in on cotton." He must use the full amount of fertilizer and follow all other practices recommended.

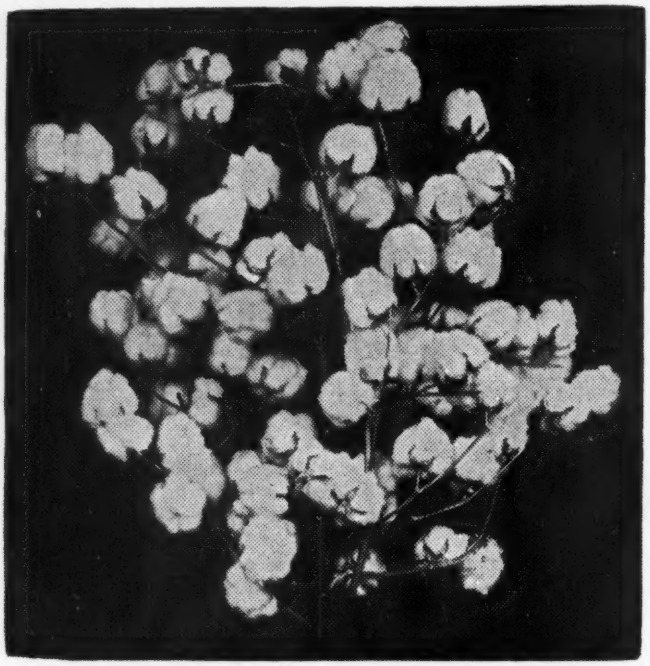
Another "must for high profits—just as important as kind and quantity of fertilizer—is putting the fertilizer where the cotton plant can use it. Fertilizer outside the reach of the cotton roots is of no benefit to the crop. There is an organization called the National Joint Committee on Fertilizer Application, representing the American Society of Agronomy, the American Society of Agricultural Engineers, the American Society for Horticultural Science, the Farm Equipment Institute, the National Canners Association, and the National Fertilizer Association. This committee has made a study of fertilizer placement results, and on the basis of its findings has developed a set of recommendations. Here is the set of recommendations for cotton taken from the pamphlet, Methods of Applying Fertilizer:

"Complete fertilizer applied simultaneously with planting of the seed should be placed in narrow bands approximately 2½ inches to either one or both sides of the seed row and 2 to 2½ inches below the level of the seed. This recommendation is based upon the results of many experiments conducted under a wide range of conditions. The placement of fertilizer at only one side of the row is accomplished with minimum disturbance of the seed bed but may necessitate unbalanced design of single-row machines. Results of the Mississippi Delta Experiment Station indicate some advantage of placing preplanting nitrogen fertilizer deeper than is the usual practice.

"Fertilizer is side-placed and the seed is planted simultaneously by various machines, including multiple-row tractor outfits of either the mounted or the pull type, single-row tractor mounted equipment, single-row two-mule riding-type, and single-row one-mule walking-type machines. Some of the machines are equipped to place the fertilizer in bands, form a ridge or raised bed over the fertilizer, knock off or smooth the bed and plant the seed, all in one operation.

"When the side placement equipment is not on hand the next best method is to mix the fertilizer with the soil in the row,

(Continued on Page 50)



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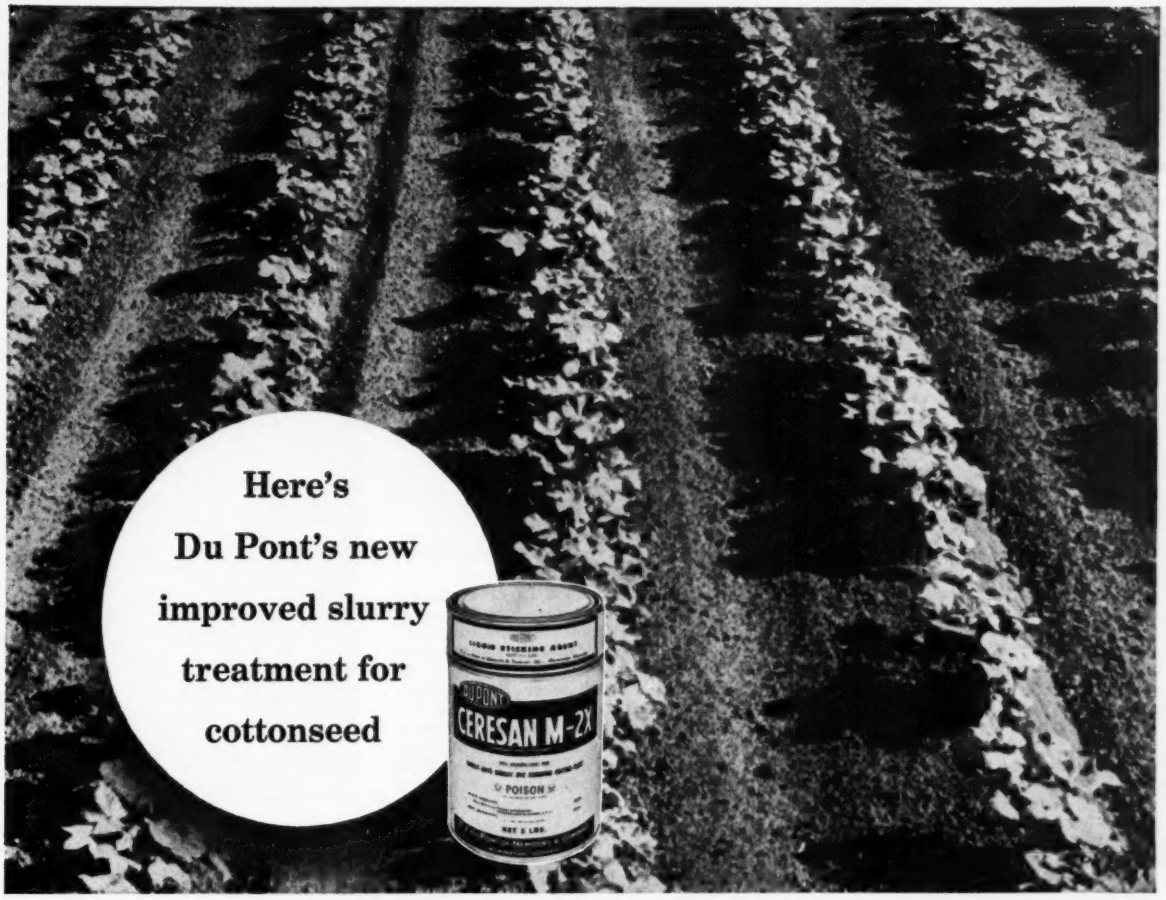

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Make Cotton Pay More in '54

Cotton Disease Losses Can Be Reduced

"It is of tremendous importance that farmers recognize . . . disease losses in order that they can more intelligently practice recommended control measures."

By JOHN T. PRESLEY

COTTON DISEASE LOSSES are known to occur every year wherever cotton is produced throughout the world. These losses may be caused by seedling diseases, wilts, root-knot, blights, root-rots and boll rots at different stages in the development of the crop.

The fight to control cotton diseases has been a long and difficult one but progress has been made. In fact more progress has been made than is being fully utilized by the growers. Many of the present disease losses could be substantially reduced and others avoided entirely if a uniform disease control program were followed. The research worker can develop excellent control measures for a disease but it is of little value to the farmer unless the information is made available to him and the control measures put into practice. It is of tremendous importance that farmers recognize the nature and cause of disease losses in order that they can more intelligently put into practice the recommended control measures.

In the early days of cotton culture in this country, growers attributed disease losses to various causes such as adverse weather, insects, excess chemicals or other materials in the soil or impervious strata underlying the plants that inhibited tap root development. It was not until 1888 that careful studies were made of the nature and cause of cotton diseases. Pammel working in Texas reported that root-rot was caused by a fungus and was not the result of unfavorable soil conditions. Soon afterward, Atkinson in Alabama published a bulletin describing the nature and cause of cotton wilt, anthracnose, angular leaf spot or bacterial blight, rust caused by potash deficiency, several leaf blights and root-knot.

Although many of the common cotton diseases have been recognized by research workers for more than 50 years and controls developed for some of them, there is no uniform acceptance of these controls among the farmers. A good example of this lack of acceptance is in seed treatment for the control of seed-borne diseases and damping-off of seedlings. The uniform cottonseed treatment committee has been in operation for many years and recommendations are made each year on the best seed treatment practices, but in spite of this, many growers plant part or all of their acreage with untreated seed. From the best estimates available it seems that only about two-thirds of the planting seed is treated each year and seedling diseases still rank number one in causing loss (Fig. 1).

JOHN T. PRESLEY is Pathologist, Field Crops Research Branch, Agricultural Research Service, USDA, Washington.

Many of the earlier recognized diseases of cotton can be largely controlled by resistant varieties, fumigants, cultural practices, or fungicides, while some of the more recent diseases are becoming increasingly destructive and widespread. For example, Verticillium wilt, ascochyta blight and Rhizoctonia soreshin have only recently become recognized as serious problems in cotton production, but they already rank among the most destructive of the diseases. Ascochyta blight is confined primarily to the humid areas of the Southeast, while Rhizoctonia soreshin and Verticillium wilt occur across the entire Cotton Belt.

To be most effective any cotton disease control program should be well planned and thoroughly executed. The plan should include such items as early destruction of diseased crop residues, thorough and adequate seed treatment, the use of resistant varieties where possible and cultural practices throughout the year which have been shown to reduce the incidence and severity of diseases.

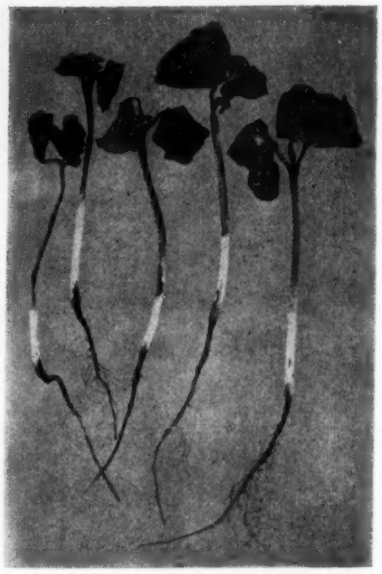


Figure 1. Diseased seedlings such as these are often found in fields planted with untreated seed.

Diseased crop residue destruction is very important where cotton follows cotton, and where diseases such as bacterial blight, anthracnose and ascochyta blight are present in the field. When crop residues are carefully turned under early in the fall there is little carryover of organisms from the diseased material to the new cotton crop in the spring. Under irrigated conditions, it may be necessary to provide an early spring irrigation in order to be sure that the crop residues are decaying prior to planting time.

Many disease organisms may be carried on the cottonseed, but they can be effectively removed by acid delinting or by use of recommended seed treatment materials. Seed treatment is useful in removing or destroying the seed-borne organisms and in addition will protect the seed for a time against soil-borne organisms after planting. A thorough job of seed treatment is the best assurance of obtaining a uniform stand from the first planting. However, there may be occasional periods of extremely unfavorable weather following planting where even the best job of seed treatment will not protect all of the seedlings, but on the average seed treatment is a sound practice and a good investment.

Over a period of several years federal and state research workers across the entire Cotton Belt have developed seed treatments that are effective. However, if the materials are not applied properly or in sufficient quantity, the treatment is little better than none at all. It is

Figure 2. The wilt-susceptible variety planted in the center rows has been completely killed while the wilt-resistant varieties in adjacent rows show little or no effect of wilt.

therefore of utmost importance to be sure that the seed is properly treated and to carefully avoid planting any untreated seed which might infect the remainder of the crop. The best time to control a cotton disease is before it gets started.

Today almost any farmer will tell you that he had trouble from some disease or other in his cotton during the year. Perhaps he planted untreated seed or a wilt-susceptible variety on wilt-infested soil. On the other hand he may have been very careful to purchase the best seed available and to be sure that it was properly treated and then find that he runs just a little short of finishing his planting with the seed. He may then purchase one bag of seed locally just to finish out. This seed may be of a poor quality and not treated. In this way a grower may introduce a seed - borne disease such as bacterial blight which can affect a large part of his crop before the season is over. Bacterial blight spreads very rapidly under proper conditions and from original centers of infection can cover an entire field in a relatively short time.

In areas where Fusarium wilt is present, satisfactory crops can be produced if one of the wilt resistant varieties is planted. Most losses from Fusarium wilt at the present time are due to the fact that farmers either fail to recognize the presence of Fusarium wilt in their fields or fail to plant resistant varieties (Fig. 2). There are several resistant varieties currently available which yield as well as susceptible varieties even on wilt-free soil. Consequently there is no disadvantage in the use of these resistant varieties, particularly in the Southeast.

It has been shown that where root-knot nematodes are present, Fusarium wilt is especially severe, and since these nematodes are rather uniformly distributed over the light, sandy soils of the Southeast, the use of wilt resistant varieties should be a uniform practice. No varieties are known at the present time which have a high degree of resistance to nematodes. Soil fumigation, however, will effectively control nematodes, and yields are usually increased sufficiently to more than offset the cost. Any of the soil fumigants recommended by the state experiment stations are effective against nematodes when used as directed (Fig. 3).

In areas where Verticillium wilt is present the best method of reducing loss in upland cotton is the use of cultural practices which permit rapid warming of the soil in the spring and maintain a relatively high soil temperature throughout the growing season. Cantaloupe-type beds have been used to advantage in the El Paso Valley. Rotation with non-susceptible crops is advantageous and increasing the plant population (planting thicker in the row) has given significant increases in yield. American- Egyptian cottons are highly resistant to Verticillium wilt. In the Southwest this type of cotton is often grown where Verticillium is especially severe.

Root-rot losses have been greatly reduced in recent years, particularly in Texas, by rotating cotton with Hubam clover or by using Hubam as a winter cover crop to be turned under before planting the cotton crop. Other practices that have been found helpful in reducing root-rot losses are early fall plowing, the addition of nitrogen and manure to the soil, deep tillage and rotation with non-susceptible crops such as sorghum, corn or small grains.

Boll rots are a source of considerable loss to growers, particularly in the humid areas of the Southeast and in excessively rank cotton under irrigated conditions. Chemical defoliation has been helpful in reducing boll rots by opening up the plants to sunlight and free air

Estimated Reduction (%) in 1953 Cotton Yield Caused by Disease

Diseases	Calif.	Ariz.	N. Mex.	Tex.	Okla.	Mo.	Ark.	La.	Miss.	Ala.	Ga.	S.C.	N.C.	Tenn.	% Loss	Total Bales Lost
PARASITIC																
Fusarium Wilt *F. vasinfectum*	0	0	0	.03	**	3.5	2.2	1.5	4.0	1.0	3.5	2.0	2.0	1.7	1.36	256,253
Verticillium Wilt *V. albo-atrum*	13.0	1.6	4.8	.46	**	0	.7	.1	1.0	0	0	0	.5	1.6	2.10	399,009
Bacterial Blight *X. malvacearum*	**	.4	.3	2.8	4.0	.5	.2	.5	.5	.5	1.8	3.3	.8	.4	1.27	240,796
Root Rot *P. omnivorum*	**	2.6	.1	2.45	0.3	0	**	**	0	0	0	0	0	0	.79	149,627
Anthracnose Boll Rot *G. gossypii*	0	0	0	.43	**	0	**	.5	.3	1.0	.3	.3	.2	.3	.28	52,574
Seedling Diseases *Rhizoctonia*, etc.	3.0	2.6	.6	1.77	2.0	2.5	.9	2.5	3.3	1.0	3.0	2.4	2.5	4.0	2.28	431,473
Ascochyta Blight *A. gossypii*	0	0	0	.13	0	0	0	0	**	0	.3	.5	.1	.05	.08	14,234
Boll Rots *Rhizopus*, etc.	.5	.3	0	.10	.2	0	**	1.5	.5	2.0	1.8	1.5	1.0	.1	.55	103,842
Root Knot *Meloidogyne* sp.	4.0	3.0	.3	.73	.2	1.0	**	2.0	1.0	3.0	3.5	3.3	3.0	.7	1.70	322,590
Total	20.5	10.5	6.1	8.90	6.7	7.5	4.0	8.6	10.6	8.5	14.2	13.3	10.1	8.85	10.41	1,970,808
NON-PARASITIC																
Others, including Deficiency Diseases	1.5	1.8	.2	.96	1.5	.5	11.0	2.6	2.8	3.0	4.5	4.5	2.3	6.0	3.06	578,425
Total (%) Loss	22.0	12.3	6.3	9.86	8.2	8.0	15.0	11.2	13.4	11.5	18.7	17.8	12.4	14.9	13.47	
Total Bales Lost	486,538	139,970	22,188	475,826	39,750	38,696	273,529	102,793	331,905	126,045	174,809	150,499	64,123	122,562		2,549,233
Total Yield, Bales*	1,725,000	998,000	330,000	4,350,000	445,000	445,000	1,550,000	815,000	2,145,000	970,000	760,000	695,000	453,000	700,000		16,381,000

*BAE, December, 1953
**Trace

Figure 3. Cotton growing in a field severely infected with nematodes. The rows at the left received no treatment while those at the right were treated with ehylene dibromide, row treatment, at the recommended rate.

passage. Under special conditions bottom defoliation has been used to advantage in preventing rots of lower bolls. Growers should avoid extra heavy applications of nitrogen which produce excess vegetative growth and in the Southwest it is very important to avoid heavy irrigations late in the season. Such irrigations maintain a high moisture content of the air at the base of plants for several days, and considerable boll rotting usually results.

The organisms which cause anthracnose and bacterial boll rot are often carried on the seed and are sources of infection. These diseases are partially controlled by sanitation practices and seed treatment.

Since certain diseases are capable of attacking the cotton plant at all stages, from seedlings to harvest of the crop, it is obvious that to be most effective a disease control program should start with the planting of the seed itself and be followed conscientiously throughout the season. No farmer would consider using insect control during the early part of the season and then waiting until the crop is practically destroyed before continuing the control program. The same principle holds in relation to disease control. In many instances the farmer does not notice the presence of a disease until it has progressed to the point where control measures are not effective. Therefore it should be repeated that the best disease control program is a consecutive and continuous program.

Intensified efforts are being supported by federal, state and private interests, to develop control measures for, or varieties resistant to, the various diseases. The problems are not always simple and easy of solution, however, and they will remain with us so long as we continue to have new and destructive diseases to plague the cotton farmer.

Although the cotton crop has never been subjected to widespread epidemic losses such as have occurred in wheat, tobacco and other crops, the losses are serious and should be considered as such.

At present the average loss from all diseases is about one-seventh of the crop annually. Prevention of these diseases, many of which can be controlled, does not necessarily mean a drastic increase in over-all cotton production. Might it not better mean a considerable reduction in the labor and cost of production or a release of depleted cotton land for a program of soil restoration? Whichever philosophy we accept, the moral is the same: prevention of loss from diseases does not mean suffering from overproduction; on the contrary, it provides an opportunity for improving the lot of the farmer by increasing the efficiency of production with a correspondingly greater return per unit produced.

Charles P. Reid, Marianna Sales Co., Dies Feb. 18

Charles P. Reid, Sr., Memphis, chairman of the board of Marianna Sales Co., died Feb. 18 at Fort Myers, Fla. Services were held Feb. 20 at Memphis. He was a past president of Memphis Merchants Exchange and one of the original incorporators of the Memphis Merchants Exchange Clearing Association, and had many friends throughout the cottonseed crushing industry.

Born in Canton, Miss., Reid was connected with several Mississippi and Louisiana oil mills in his early business career. He was manager of the Warren Cotton Oil Mill at Warren, Ark., and the Buckeye Cotton Oil Mill and Rose City Cotton Oil Mill, both at Little Rock.

During World War I, Reid managed the East St. Louis Cotton Oil Co. and the Louisville Cotton Oil Mill Co. After the war he operated a cotton oil mill at Marianna, Ark., for a time, but the plant burned. He then spent some time with Burton-Dixie Corp. in Little Rock and served as director of the publicity bureau of the Arkansas Cottonseed Crushers' Association.

Reid went to Memphis in 1922 and opened the Marianna Sales Co., cottonseed products firm. He was president of the firm until 1952 when he became chairman of the board.

Survivors include his widow; two sons, W. T. and C. P. Reid, Jr.; a daughter, Mrs. Frederick Walker; two brothers and a sister.

5 Percent Fat Gives Best Result in Lamb Ration

Rendered animal fats were satisfactory sources of energy in lamb fattening rations at levels of 5 to 10 percent of the ration, Texas Experiment Station found in a recent trial.

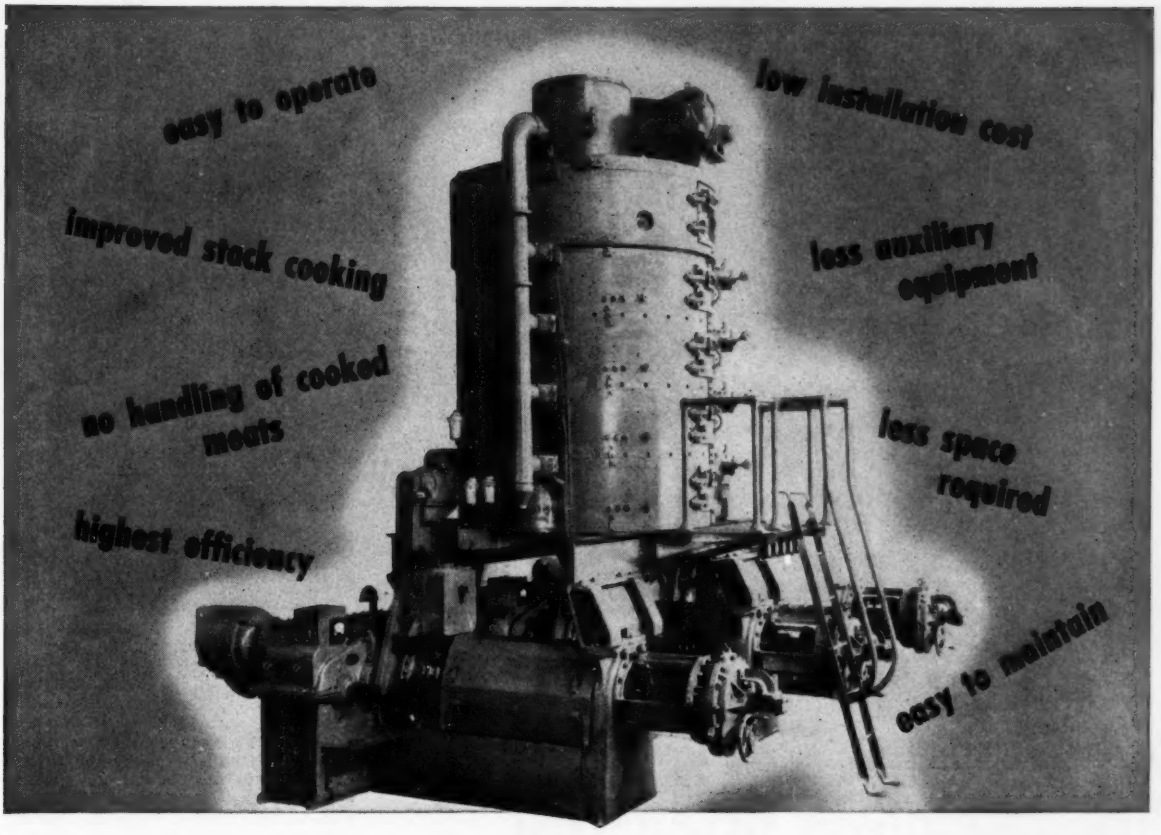
Choice white grade tallow and special grade tallow were incorporated into the rations of three groups of fattening lambs at levels of 5, 10 and 15 percent. A fourth group of lambs served as a control. Other feeds in the rations were grain sorghum, cottonseed meal, molasses and alfalfa hay.

Lambs on a ration containing 5 percent rendered fats made the highest, most efficient and cheapest gains, had the highest dressing percentages and the highest carcass grades.

At the 10 percent level, lambs made more efficient gains than the control group which received no fats but were about equal to the control in rate of gain and dressing percentage. Although this group had slightly higher carcass grades, the cost of gain was increased.

The lowest, least efficient and most costly gains were produced by the lambs fed 15 percent animal fats. Their dressing percentages were lowest and carcasses poorest.

Results of these studies are reported in Progress Report 1644, available from Agricultural Information Office, College Station, Texas.



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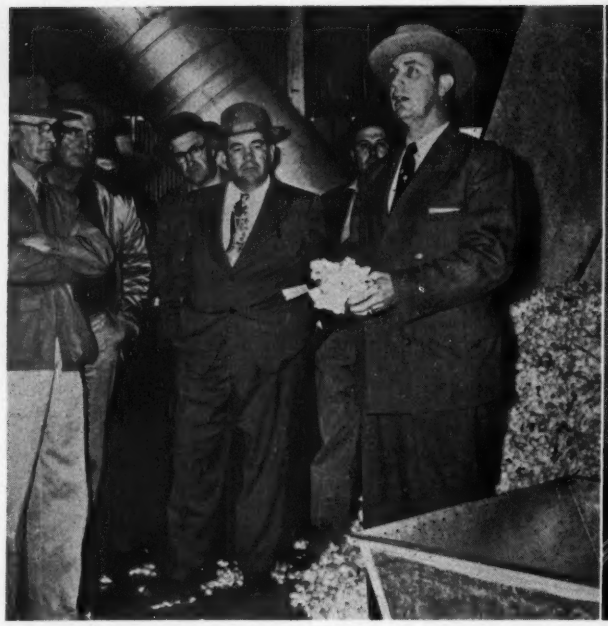
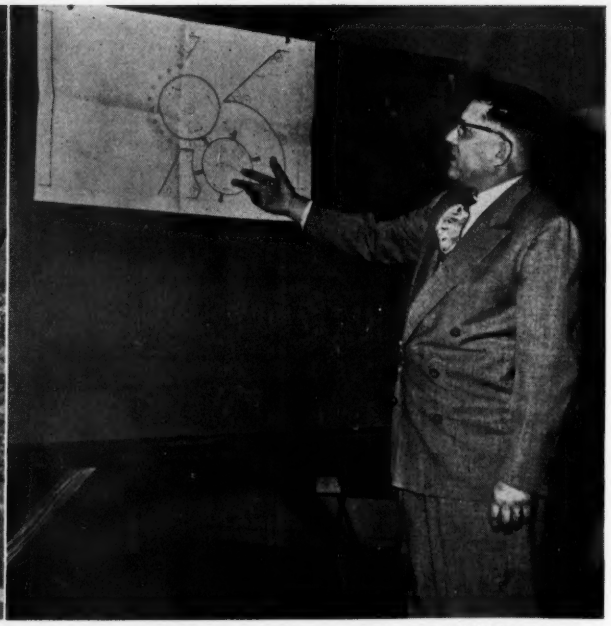




CG&OMPress Photos.

ABOVE, left, ginners listen with interest as J. A. Luscombe discusses the results of a test run of the new USDA stick remover at the experimental gin located at Chickasha. At right, Gerald F. Franks of the USDA Cotton Ginning Laboratory staff at Stoneville, where the machine was developed, uses a drawing to explain its operation.

At Chickasha, Feb. 16

Stick Remover Given Test At Ginners' Field Day

■ OTHER FEATURES included reports on variety and stripper harvester tests . . . recommendations to ginners on drying and lint cleaning . . . greenhouse visit and exhibits.

THE 60-INCH experimental stick remover designed and built at the USDA ginning laboratory at Stoneville, Miss., was the major point of interest for Oklahoma ginners who attended the fourth annual ginners' field day at Chickasha on Feb. 16.

A demonstration of the stick remover took place in the USDA experimental gin located at the Cotton Research Station of the Oklahoma A. & M. College. The demonstration was conducted by J. A. Luscombe, agricultural engineer in charge of the experimental gin.

Gerald F. Franks of the Stoneville ginning laboratory, who had a leading role in developing the stick remover, discussed its operation at the morning session. While it is known that the stick remover does an outstanding job—as was shown during the demonstration later in the day—no performance data are yet available to indicate its potential worth.

• **Stick Remover Wins Approval**—But the ginners who witnessed the demonstration were enthusiastic about the amount of sticks and trash it removed from machine stripped cotton. Another of the experimental machines is located at Stoneville, Franks said, but the first actual performance records are expected to be developed in extensive tests at Chickasha this fall.

Luscombe told the ginners that new machinery and equipment installed at the experimental gin during the past year, in addition to the stick remover, include a hopper-type scale for more accurate weighing of test lots of cotton, a feed controller for feeding cotton into the system in a uniform continuous flow, a permanent-type magnet for removal of nails, bolts, nuts and other scrap iron, a green boll trap and new brush and grid bar assemblies for the lint cleaners. In addition, piping systems were rearranged so that stage drying could be employed.

In discussing the use of high temperatures for drying cotton, Luscombe said: (1) there is a substantial weight loss and (2) fiber length is shortened to some degree. "On cotton snapped before frost," he declared, "single stage drying with temperature of 150° F. proved most profitable. This was also true for cotton damp with plant moisture or damp with atmospheric or surface moisture."

• **Recommendations to Ginners** — Luscombe made the following recommendations to the ginners:

1. Maximum amounts of overhead and lint cleaning are not in the producer's favor if there is a chance that the rise in grade due to removal of leaf may be offset by the color discount assigned to the higher grade. In other words, be sure the Middling grade will not fall into the Strict Middling Light Spot class after cleaning is performed. This applies to the entire range of grade. If, however, there is a color additive to original grade, additional cleaning may be profitable.

2. Lower temperatures should be used in the drying process. Only enough heat should be employed to prevent rough preparation. Temperatures should be measured at the point where the cotton is introduced into the hot air stream and on most cotton this temperature should never exceed 200° F.

3. Boll opening devices will give a substantial increase in lint turnout and will have no adverse effects on grade unless the color is bordering on the low side of the spot classification.

"Other practices which might well be used," Luscombe said, "are feed control to prevent slugging and to insure uniform flow. Magnets and green boll removers should be used in the system ahead of the first moving unit so that scrap iron and green bolls can be removed before contacting cylinders and screens."

• **Results of Stripper-Variety Tests**—John M. Green, Oklahoma Experiment Station agronomist, Stillwater, and Ed S. Oswalt, Chickasha station superintendent, reported on results of tests of cotton varieties for stripper harvesting in 1952 and 1953. Highlights of their report:

Variety tests were harvested by mechanical stripper at four locations in Western Oklahoma in 1952 and 1953. The tests included seven varieties selected for their adaptation to stripper harvest.

CR-3, an experimental strain, was consistently high in lint yield. The three

recommended stripper varieties, Stormproof No. 1 (Lockett No. 1), Northern Star, and Lankart 57, were next in order.

Gin turnout reflects varietal differences in both seed-lint ratio and trash in the harvested sample, with the six top varieties ranging from 25 to 28 percent.

Pre-harvest losses varied more for locations than variety, all varieties being satisfactory on the average.

Harvest losses were low for all varieties when good stripping conditions existed. The results emphasize the importance of uniform stands in stripper-harvested cotton.

Pre-harvest losses determined in storm tests at three locations show a wide range among varieties as well as locations. Location differences were due to differences in degree of drouth stress and maturity of the crop.

• **Other Program Features** — E. W. Schroeder, head of the department of agricultural engineering at Oklahoma A. & M., presided at the morning session. In addition to those already named, other speakers included Jay G. Porterfield and E. M. Smith, both agricultural engineers at Oklahoma A. & M., who discussed the results of tests on mechanized planting and harvesting.

Louis E. Hawkins, vice-director of the Oklahoma Experiment Station, presided at the afternoon session. Speakers were R. M. Lucas of Chickasha Cotton Oil Co. and chairman of the Oklahoma Cotton Research Foundation, and E. V. Painter, director of research and development, Johnson & Johnson, Chicago.

The program included a visit to the greenhouse at the Chickasha station, and special exhibits as follows: Cotton Varieties for Oklahoma, John M. Green; Small-Scale Ginning for Evaluating Research, John M. Green; Cotton Seedling Diseases, L. A. Brinkerhoff; Organisms Causing Diseases in Cotton, L. A. Brinkerhoff; Experimental Equipment for Harvesting, E. M. Smith; Seed-Grading Laboratory, Jay G. Porterfield; Control Laboratory for Gin Samples, J. A. Luscombe; Lint Samples from Harvesting and Ginning Tests, J. A. Luscombe.

A complimentary lunch was served visitors by Clay Potts, director of short courses, Oklahoma A. & M. College.

Rules Committee of NCPA Holds Memphis Meeting

A meeting is being held Monday, March 1, in Memphis by the rules committee of the National Cottonseed Products Association to review revised drafts of the Association's rules. All proposals tentatively approved at this meeting will be distributed to members 30 days prior to the 1954 convention. The rules committee will meet in regular session May 7 to consider objections or recommendations on proposed changes, and will then make its recommendations to the convention.

Flaxseed Crop Decreases

World production of flaxseed during 1953 was the second smallest since 1946, USDA estimates. The harvest of 123.4 million bushels compared with 128.2 million in 1952 and was only slightly above the small 1951 crop. The decline in production was largely in Argentina, but Canada, Uruguay and Soviet Union also showed substantial decreases.

• Status of Mellorine Bills Summarized

STATUS of current mellorine legislation is summarized by National Cottonseed Products Association as follows:

The Louisiana State Board of Health has postponed, until July 1, the effective date of its standard for mellorine. The standard was originally scheduled to go into effect Feb. 1 and would have permitted the sale of mellorine in the state on that date.

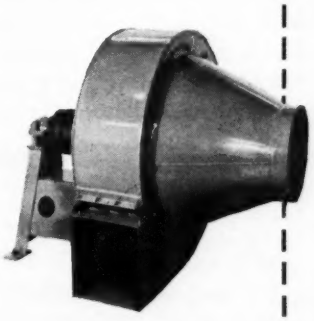
In postponing the effective date, the Board was bowing to extremely heavy pressure. Dairy strategy apparently is to keep the product off the market, where it would gain consumer support, until the Legislature meets in May. Then, an effort will be made to pass a law prohibiting the sale of the product.

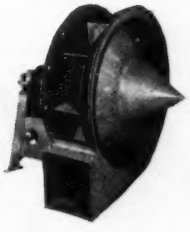
The South Carolina bill that would legalize the sale of mellorine in that state has passed second reading in the House. It was amended, however, to permit only cottonseed and soybean oils to be used in mellorine. It is expected to be passed and sent to the Senate.

A hard fight is under way on the mellorine bill in Mississippi. Dairy organizations are apparently trying to make this state a "test case." The outcome is uncertain.

■ **ED LIPSCOMB, Memphis, director of sales promotion and public relations, National Cotton Council, has received his third award from the Freedoms Foundation. He received the 1953 George Washington Honor Medal for a speech, Let's Get Lost. He also was honored last year and in 1950.**

"The BOARDMAN SUPERBLAST UNLOADS IN RECORD TIME"





If you want to speed up unloading, believe me you can do it with a BOARDMAN Superblast Unloading Fan! Never saw anything to equal that perforated, cone-shaped screen in getting the air through quicker and letting the cotton slide over fast and easy. Of course, the cotton is thrown off the screen and picked up again by the air blast at the outlet. That way, the blades never strike the cotton, and roping, seed cracking and fire hazards are eliminated. Yes, sir—that BOARDMAN Superblast Unloading Fan will do the fastest, most economical job for YOU. See it soon!

Conveying Fans
Conveyor Boxes and Covers
Pneumatic Seed Cleaners

THE BOARDMAN CO.
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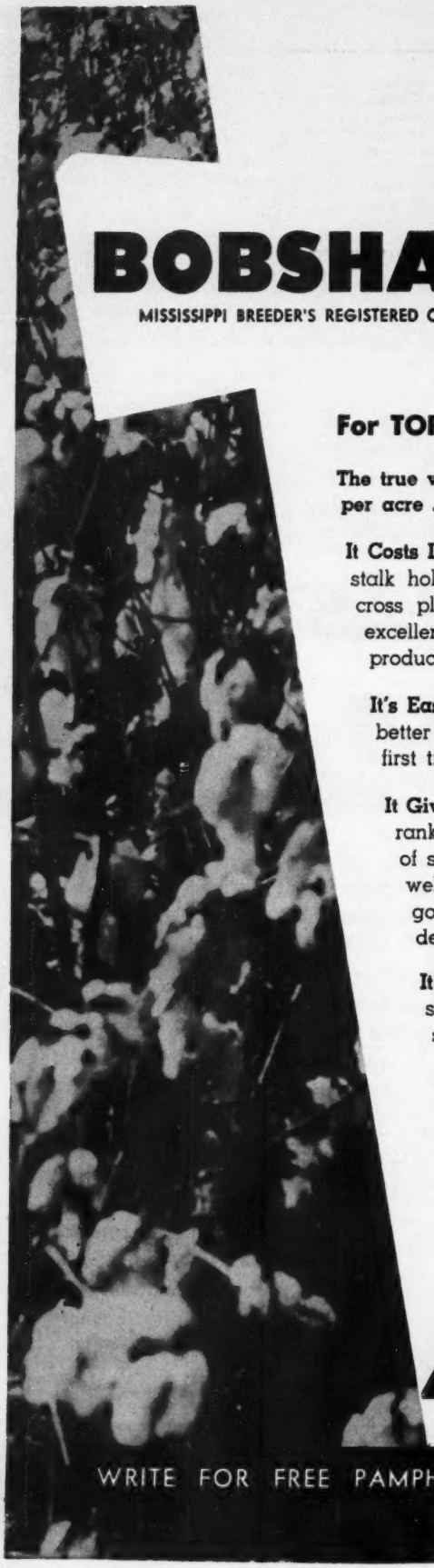
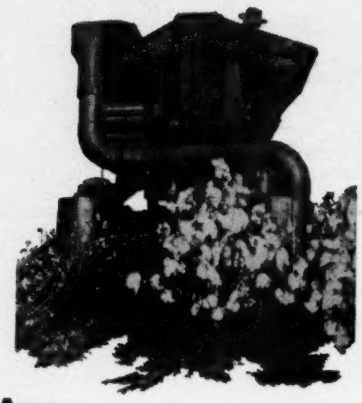
1413 S. W. 11TH ST. PH. MElrose 8-5433



BOBSHAW 1A

MISSISSIPPI BREEDER'S REGISTERED COTTON PLANTING SEED



For TOP Dollar Return Per Acre

The true value of a cotton planting seed is in its net dollar return per acre . . . and BOBSHAW 1-A is tops! Here's why:

It Costs Less To Produce: BOBSHAW 1-A's medium tall, upright stalk holds its lowest branches well off the ground permitting cross plowing, flame cultivating and mechanical picking with excellent results. It's the one cotton ideally suited to mechanical production.

It's Easy To Pick: By hand or machine BOBSHAW 1-A picks better and faster. The majority of the crop is harvested the first time over.

It Gives High Yields and High Gin Turnout: BOBSHAW 1-A ranks as one of the South's leaders in both yield per acre of seed cotton and in lint percent after ginning. It cleans well at the gin without damage to the strong fibre, giving good grades and very few neps, which makes it in high demand by spinners.

It Matures Early and Uniformly: You save on costly late season insect control, and can harvest before bad weather starts.

Add it up! BOBSHAW 1-A's money-making characteristics mean more net profit . . . more dollar return from every cotton producing acre Get full information by writing us, today!

BOBSHAW

SEED COMPANY

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WRITE FOR FREE PAMPHLET AND PRICES ON BOBSHAW 1-A

V. A. Johnson, Pres. P. H. Brown, Plant Breeder F. L. Gerdes, Mgr.

In Memphis, March 18-19-20

Bruton Announces Program Plans

■ ARKANSAS - MISSOURI and Tennessee ginners to hear Jackson and Lipscomb. Over 50 exhibits are already scheduled for gin supply show.

Program for the annual joint convention of the Arkansas-Missouri and Tennessee ginners' associations has been announced by W. Kemper Bruton, executive vice-president of the Arkansas-Missouri group. The meetings will take place March 18-19-20 in Memphis and will be held concurrently with the third annual Midsouth Gin Supply Exhibit.

Featured speaker for the first day, March 18, will be Robert C. Jackson, executive vice-president of the American Cotton Manufacturers' Institute, Washington. Ed Lipscomb, sales promotion director for the National Cotton Council, Memphis, will address the group on March 19.

Producing and Harvesting for Quality Ginning is the title of a panel discussion planned for the first day of the convention. J. Ritchie Smith, Memphis, National Cotton Council, will be moderator.

Scheduled to contribute to the panel are C. A. Tate, Mississippi State College, State College; John Dameron, Arkansas Experiment Station, Marianna; Rex F. Colwick, Mississippi Experiment Station, State College; W. H. Haslauer, East Prairie, Mo., ginner, and J. C. Oglesbee, USDA Extension ginning specialist, Atlanta.

Cotton Quality from Producer to Consumer is the subject chosen for a panel discussion on March 19. Participants will be Mrs. Louise Klaer, Goldsmith Department Store, Memphis; Gordon McCabe, J. P. Stevens Co., Greenville, S.C.; Vernon Moore, technologist, U.S. Cotton Ginning Laboratory, Stoneville, Miss.; Charles Merkel, senior agricultural engineer, Cotton Ginning Investigations, Stoneville; and Robert E. Grove, Bemis, Tenn., ginner.

As prospective exhibitors in the Midsouth Gin Supply Exhibit are reminded elsewhere in this issue, they should get in touch with Bruton to reserve space. As the magazine went to press, he reported that over 50 firms have made reservations for space at the show. They include:

Adkins-Phelps Seed Co.; Allis-Chalmers Manufacturing Co.; Arkansas Pedigreed Seed Co.; Blytheville Fertilizer Corp.; Bobshaw Seed Co.; Braden Steel Corp.; Breland Adams Co.; L. P. Brown Co.; Butler Mfg. Co.; Cen-Tennial Cotton Gin Co.

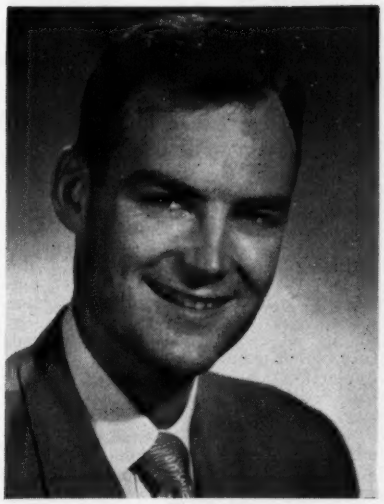
Sam Clements & Co.; Climax Engine and Pump Manufacturing Co.; Continental Gin Co.; The Cotton Digest; CO2 Fire Equipment Co.; Cummins Diesel Sales Corp.; Dabney-Alcott Supply Co.; Dealers Equipment Co.; John Deere Plow Co.; Delta & Pine Land Co.

Egle-Trobaugh Electric Co.; Eriez Mfg. Co.; Fairbanks-Morse Co.; Ferguson-Wallace Co.; Julius Friedlander Co.; Geigy Co.; Ginwright Engineering Co.; Hays Supply Co.; Hardwicke-Etter Co.; Hinckley Gin Supply Co.

Industrial Electric and Supply Co.; Industrial Scale Co.; International Harvester Co.; LeRoi Co.; Lewis Diesel Engine Co.; Ludlow Manufacturing and Sales Co.; Lummus Cotton Gin Co.; Magni-Power Co.; Mathieson Agricultural Chemicals Div.; John E. Mitchell Co.; Moss-Gordin Lint Cleaner Co.

The Murray Co. of Texas; Dan Puller Co.; Reichman-Crosby Co.; Shelby Electric Co.; Stoneville Pedigreed Seed Co.; Texas Tag and Specialty Co.; Tobacco Byproducts and Chemical Corp.; The Todd Co.; Tri-States Armature and Electrical Works; Unox Co.; Wonder State Manufacturing Co.

An entertainment feature of the show and convention will be a variety show which will be presented Friday night, March 19, at Ellis Auditorium. Bruton describes the show as "big and colorful." Admission will be free to convention goers, their families and guests.



Manley New Briggs-Weaver General Sales Manager

DARRELL MANLEY, above, recently was named general sales manager of Briggs-Weaver Machinery Co., of Dallas. Ed Pflanz is vice-president of the company, in charge of sales. Briggs-Weaver has branches in Houston and Fort Worth.

AMSCO Prepares Guide To Petroleum Solvents

A handy buyers' guide to petroleum solvents and their properties has been prepared by American Mineral Spirits Company. It is a four-page, file-type folder designed to save time in choosing the correct solvent for individual product needs. It contains a comprehensive list of aliphatic naphthas, paraffinic hydrocarbons, and aromatic hydrocarbons and solvents—and their typical properties. Copies are offered free on request to American Mineral Spirits Co., 155 East 44th Street, New York City, or 230 North Michigan Avenue, Chicago 1.

■ **WALTER H. SMITH, Fountain Inn, S.C., has announced that J. T. BROOKS, JR., and H. C. BROOKS have been named officers in the firm Smith & Brooks. The company was formerly known as Rabb & Smith.**

• To Sleep, Not Slip, Snooze in Cotton

EVERY MAN who has spent a sleepless night slithering around in slippery synthetic pajamas is eligible for membership in COPS, an organization proposed by Walton Gresham, Indianola, Miss. Full name of the Gresham group is Committee To Oppose the Purchase of Slippery Pajamas by Women for Men.

In a letter to the Memphis Commercial Appeal, Gresham pointed out: (1) No man would buy slippery pajamas for himself; (2) Most men's pajamas are bought by women who, for some reason, usually get the slippery kind; and (3) They ought to be stopped.

"If women like these electrified garments, let them wear 'em. But dee-liver me," Gresham commented. Husbands, he adds, want their pajamas all cotton and, if necessary, a yard wide.

"I have been a pajama sleeper, man and boy, top and bottom, for many years," this hero to every male member of the cotton industry said, "but if this trend toward static electricity in my sleepers continues, there's going to be a change.

"A thing like this is enough to drive a man back to the old-fashioned nightgown."

Trends in 1953 Margarine Production Summarized

The margarine industry used 1,048,617,000 pounds of fats and oils in 1953, the Bureau of Census annual summary shows. This compares with 1,046,010,000 pounds of fats and oils used in 1952 and 850,750,000 in 1951.

Hydrogenated soybean oil accounted for 664,122,000 pounds of the total, compared with 570,738,000 in 1952 and 402,689,000 in 1951. Margarine consumed 231,472,000 pounds of hydrogenated cottonseed oil last year, compared with 277,731,000 in 1952 and 256,951,000 in 1951. Refined cottonseed oil used amounted to 43,035,000 pounds last year, against 75,325,000 the previous year and 75,944,000 in 1951.

Total margarine production last year was 1,291,803,000 pounds. This compares with 1,285,975,000 in 1952 and 1,040,718,000 in 1951. Shipments were 1,294,647,000 pounds, against 1,281,100,000 in 1952 and 1,036,572,000 in 1951.

Monthly production of margarine reached its peak last year in October, when 136,217,000 pounds were produced.

By type of package, Census reports show that there was an increase in one pound regular packages, and bulk production in both pats or chips and in packages of over one pound. Packaging in one pound plastic bags, however, continued to decline as it had in 1952.

Fertilizer Schools Held For Arkansas Dealers

A series of schools for fertilizer dealers has been in progress in Arkansas. Sponsored by the Extension Service, the meetings were designed to cover changes in fertilizer recommendations, soil type and response to fertilizer, soil compaction problems, and other problems.

Meetings yet to be held include one at Harrison March 2 and one at Fort Smith March 3. Other meetings were held at Hope, Monticello, Stuttgart, North Little Rock, West Memphis and Newport.

In Charlotte, Feb. 15-16

Carolinas Ginners Hold Convention

■ 1954-55 OFFICERS include Wannamaker, Upchurch, Harvin and Hardy. Claude L. Welch was among guest speakers.

The Carolinas Ginners' Association, Inc., opened its fifteenth annual meeting Feb. 15 in Charlotte, N.C., with an invocation by the founder, Fred P. Johnson of the North Carolina Department of Agriculture. A brief welcome was given by Clifford H. Hardy, Bennettsville, S.C., executive secretary, who also discussed highlights of the recent meeting of the National Cotton Council at Atlanta.

Named officers for 1954-55 were Frank M. Wannamaker, Farmers Gin & Feed Co., St. Matthews, S.C., president; Clyde E. Upchurch, Jr., Hoke Oil & Fertilizer Co., Raeford, N.C., first vice-president; C. A. Harvin, Jr., C. A. Harvin Ginnery, Summerton, S.C., second vice-president; and Clifford H. Hardy, Bennettsville, S.C., executive secretary. Wannamaker succeeds Myers W. Tilghman, Dunn, N.C.

Claude L. Welch, Memphis, director of the Production and Marketing Division of the National Cotton Council, was the first guest speaker. Welch told the group that the ginners' best chance of getting public research on their complex problems is to push for research for the entire cotton industry, which in turn would put its aggregate weight behind adequate research for agriculture in general.

Commenting on the budget submitted by the Administration for USDA, Welch called it a "most encouraging bit of evidence." He warned, however, that "Congress still has to appropriate the money and favorable action by the Congress is by no means assured."

In the absence of Myres W. Tilghman, the 1953-54 president, Clyde E. Upchurch, Jr., last year's vice-president, presided and gave Tilghman's annual message, outlining the accomplishments of the Association in the past year.

Horace Godfrey, USDA, Raleigh, showed ginners how they could best help in getting customers to plant alloted acreage. He outlined details of administering the acreage allotment program this year.

Paul Keller, Clayton, N.C., secretary of the North Carolina Promotion Committee, reported on work done by his committee in behalf of acreage allotment increases and cotton's maintaining its rightful place in the state.

H. G. Connolly, director, classification service, Cotton Branch, USDA, Raleigh, displayed cotton standards and discussed problems involved in administering the classification service. He emphasized the value of the service and urged ginners to participate fully.

Frank Barlow, Washington, a member of the foreign trade division of the National Cotton Council, forecast that American cotton exports for the 1953-54 crop year will exceed those of the preceding crop year by a half million bales. Barlow stated that activity of foreign mills is a sure sign of strength, and demand for textile production in foreign countries is increasing. Prospects for expanded cotton production in other countries are less favorable than a year ago, he said.

The annual banquet was held in the balllroom of the Hotel Charlotte. F. H. Heidleberg, National Cotton Council Huntsville, Ala., opened the occasion with prayer. Awards for the annual golf tournament were presented immediately after dinner, and dancing followed a floor show. The annual golf tournament was played Sunday afternoon, Feb. 14.

Tuesday, Feb. 16

Newly-elected President Frank M. Wannamaker opened the morning session. First speaker on the program was M. R. Powers, farmer, ginner and businessman of Bennettsville, S.C. Powers, formerly with the Edisto, S.C., Experiment Station, talked on developments in weed control.

Charles Merkel of the USDA Cotton Ginning Laboratory, Stoneville, Miss., discussed new developments in gin machinery.

Secretary Hardy read an address prepared by Hugh Agnew, president of the South Carolina Farm Bureau Federation. Agnew, who was unable to attend the meeting, commended ginners for rapid progress in providing modern equipment without increasing the cost to the farmer. He urged ginners to use drying equipment carefully.

The remainder of the program was devoted to the convention's theme: The Conservation of the Spinning Properties in the Ginning Process. Preceding the panel discussion on this subject T. L. W. Bailey, Jr., and William Hart of the Institute of Textile Technology, Charlottesville, Va., gave a report on recent studies and experiments relating to overdrying and overmachining cotton.

The panel discussion moderated by Fred P. Johnson was highlighted by the remarks of A. W. Fisher, a vice-president of Cannon Mills, Kannapolis, N.C. Others participating and giving technical advice were S. A. Williams, Clemson College, Clemson, S.C.; J. C. Oglesbee, USDA, Atlanta; Candler C. Miller and Vernon W. Hill, North Carolina Department of Agriculture, Raleigh; and J. A. Shanklin, North Carolina Extension Service, Raleigh.

J. M. Wood, Formerly With Mente, Joins Arrow Bag

J. M. Wood, former vice-president and manager of Mente & Company, Houston, is now associated with the Arrow Bag Co., Oklahoma City, as manager. Wood was with Mente & Company for 30 years in an executive capacity, and is widely known in the bag trade and among consumers of bags. He joined Arrow following liquidation of Mente.

Arrow Bag Co., manufactures new textile bags, both burlap and cotton, and reconditions and deals in used bags. E. Lee Kennedy is president of the company, which has an associate in Denver, the Arrow Bag Co. of Colorado.

Less Fertilizer in Alabama

Alabama fertilizer sales in 1953 were 83,329 tons compared with 111,271 tons in 1952.

1954 Meeting Dates Set by Council

Jan. 31-Feb. 1, 1955, have been selected as dates for the seventeenth annual meeting of the National Cotton Council. Convention site will be the Hotel Shamrock, Houston. The decision was made Feb. 19 by the Council's board of directors. Approximately 1,000 top leaders of the industry are expected to attend next year's meeting in Houston.

Clements Will Represent Hinckley Gin Supply Co.

Appointment of Sam Clements to handle sales and service for Hinckley cotton conditioning machinery in the state of Mississippi has been announced by Frank B. Hinckley, Jr., senior partner of Hinckley Gin Supply Co. at Dallas.

Clements, owner of Sam Clements &

SAM CLEMENTS

Co. at Greenwood, Miss., has been associated with cotton and cotton ginning since 1934. From 1934 to 1944 he was located in Northeast Arkansas and Southeast Missouri, buying and selling cotton and managing large gin operations. He moved to the Mississippi Delta early in 1945 as sales engineer for Lummus Cotton Gin Co. He left this position early in 1948 to organize his present business of buying and selling secondhand cotton ginning machinery and recommending machinery additions and installations for handling mechanically harvested cottons. He also worked closely with USDA Ginning Laboratory officials at Stoneville. During the 1950, 1951, and 1952 ginning seasons, he supervised operations of two large, modern gin plants in the Delta.

"Since Clements has had 20 years of diversified experience with cotton gins, cotton gin machinery, and the gin industry as a whole, including his up-to-date experience and knowledge of the requirements of late model super gins, we feel fortunate in having a man of his caliber represent us," Hinckley commented.

In Phoenix, March 20-21

Superintendents Will Convene

■ WEST COAST oil mill division to hold seventh meeting. A. L. Ward is among speakers.

The seventh West Coast divisional meeting of International Oil Mill Superintendents' Association will be held at the Paradise Inn, Phoenix, Ariz., March 20-21.

Included on the first day's program are the following: address of welcome, J. B. Moyer, Producers Cotton Oil Co. of Arizona, Phoenix; response, Tom Rollow, Western Cotton Products Co., Phoenix; The Protein Problem, A. L. Ward, director, Educational Service, National Cottonseed Products Association, Dallas; Seed Cleaning and Lint Cleaning, L. U. Cole, Industrial Machinery Co., Fort Worth.

Cattle Feeding, G. Y. Williamson, J. W. Williamson & Sons, Inc., Montebello, Calif.; Deep Tillage in Cotton Production, C. Ogle, Atlas Scraper & Engineering Co., Bell, Calif.; Do It With E's, safety motion picture, introduction by R. A. Calhoun, Industrial Indemnity Co., Los Angeles; Material Handling in the Cotton Industry, R. Quigley, E. D. Flournay Co., Phoenix; Seed Storage and Handling vs. Free Fatty Acid, G. A. Ward, Producers Cotton Oil Co. of Arizona, Phoenix; Cooking Cottonseed Meats with Blended Water, R. Meyer, L. A. Water Softener Co., Los Angeles.

The program for Sunday, March 21, includes an address, Your Capital Equipment Policy—Challenge to Recession, by R. Christian, J. D. Christian Engineers, San Francisco.

A round table discussion on the subject Solvent Operations and Plant also will take place on Sunday. C. R. Hogrefe, Los Angeles, will be moderator. Participants include W. F. Beedle, Los Angeles; H. Donahue, Phoenix; E. D. Hudson, Fresno, Calif.; E. R. Quinn, Bakersfield, Calif.; F. Ray, Phoenix; and F. D. Wilbanks, Bakersfield.

H. E. Wilson, Wharton, Texas, secretary-treasurer of the International Oil Mill Superintendents' Association will adjourn the meeting with a benediction at noon Sunday.

W. F. Beedle, chemical engineer with G. W. Gooch Laboratories, Ltd., Los Angeles, will be available to answer questions about laboratory analysis and procedures.

Entertainment features include a Western Round-Up Party Friday evening, March 19. A golf tournament will start at 2 p.m. Saturday as will a tour of local mills. A banquet and dance will be held Saturday night beginning at 7:30.

The ladies auxiliary will meet at 10:30 Saturday, a style show and luncheon will follow the meeting, and a bus tour of Phoenix will start at 2 p.m.

• The first textile patent in the U.S. was granted to James Davenport in 1794 for his carding and spinning machines.

• More Butter Sold For Cocoa Uses

THREE additional sales of USDA owned butter for experimental use as a cocoa butter extender have been made. The sales total 90,000 pounds, in addition to 30,000 pounds sold earlier, as reported in the Feb. 13 issue of The Press.

USDA will continue to receive offers to buy butter each Monday and Thursday until further notice. Most of the sales to date have been at 25 cents per pound.

Research Develops New Fertilizer Processes

Research by the Tennessee Valley Authority during the past two decades has developed a number of processes for the manufacture of fertilizer. Developments which have found commercial application include the nitric-phosphate processes for making complete fertilizers, the continuous mixing method for triple superphosphate and equipment for continuous ammoniation of fertilizer mixtures.

■ WILMER SMITH, New Home, Texas, TRUMAN L. McFARLAND, Childress, MILTON HORNUNG, Three Rivers, and JACK FUNK, Lyford, are newly elected directors of Texas Cooperative Ginners' Association. SMITH is president and FUNK vice-president of the organization, as reported in the Feb. 13 issue of The Press.

GIN FIRES STOPPED!

ERIEZ PERMANENT MAGNETS PULL FIRE-CAUSING TRAMP IRON FROM GINNING OPERATIONS THROUGHOUT THE COTTON BELT

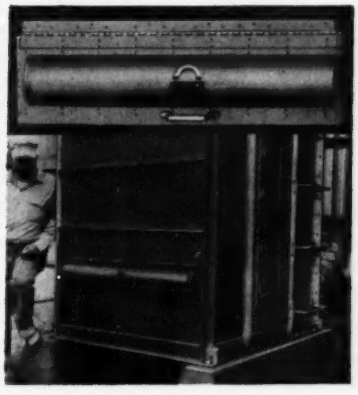
Performance Records Prove Eriez Effectiveness

"Two Eriez Tower Drier Magnets caught 300 pounds of tramp iron!" reports Ralph Pye, Manager of the Brownsville Co-operative Gin, Brownsville, Texas. "We had no fires in the 1952-53 season and we know our Eriez Magnets stopped several."

Report after report from cotton centers across the country confirm the story. Eriez Permanent Magnets are pulling tons of dangerous tramp iron from cotton processing at gins preventing fires, saving damage to saws, stopping production shut-downs and lowering insurance premium rates.

Tower Drier Magnets

The Tower Drier Magnet used by the Brownsville Cooperative Gin is only one of several Eriez Permanent Magnetic installations tailored to meet the needs of the cotton ginning industry. The Tower Drier Magnet is available in three strengths to fit any Tower Drier. Sturdy hinge allows magnet to be swung open for cleaning of tramp iron. Magnetic strength is concentrated where it will work best.



Eriez "Gin-Protection" Magnets

Eriez Magnets are made of new ALNICO V casting...completely non-electric...no wiring ...no batteries...*first cost is the last!* Magnetic power cannot fail...will last forever. Fast installation on new or existing equipment. **ERIEZ MAGNETIC SEPARATORS are approved equipment by 22 leading fire prevention and insurance associations.**

ERIEZ ERIEZ

There Is An Eriez Magnet To Fit Your Need. Write For Bulletin!

ERIEZ MANUFACTURING COMPANY
7883 Magnet Drive, Erie, Pa.

Please send me your free bulletin on magnets for the cotton ginning industry.

Name_____

Street_____

City_____ **State**_____

Company_____

SALES OFFICES THROUGHOUT THE COTTON BELT
Capstick & Company, St. Louis, Missouri; C. W. Dean & Associates, Memphis, Tennessee; Hersey-Thomas Company, Greenville, South Carolina; Glenn W. King Company, Houston, Texas; Power-Mac, Inc., San Francisco, California; C. D. Sutton & Associates, Los Angeles, California; VeeEss Engineering Company, Phoenix, Arizona; L. P. Zumstein, Port Orange, Florida.

as viewed from The "PRESS" Box

• It Pays To Meet

EACH ISSUE of The Press at this time of the year contains information about meetings of ginners and crushers of vital importance to the groups for which they have been carefully planned. Each meeting represents an opportunity to obtain timely, practical information that will help the individual members during the season ahead. Furthermore, in addition to the formal program, each meeting provides enjoyable entertainment and many chances to exchange ideas with members of the industry, including representatives of firms supplying improved equipment and practical ideas on how to use better the equipment already on hand.

These opportunities are available to every member of the organizations sponsoring the meetings—but you have to be at the meeting to get the value. Attending these meetings is just as much a part of the business of running a gin or oil mill as other duties; but it also is a pleasant experience that no one should miss. So, plan now to attend your own industry group meeting. It will pay you well!

• Matches Sell Cotton

A MATCH COVER, discarded in London last year during Queen Elizabeth's coronation, has made more business for a Texas cotton broker, E. A. Hendrie of Galveston. American newspapers featured the story of a reporter's discovery of the advertising match book on the paving stones in front of Buckingham Palace; and Hendrie says, "Many new customers contacted me as a result of the nationwide publicity about my match book." He entered his story in the prize award contest sponsored by the match industry.

• Burs Build Up Yield

DELBERT RICHARDSON, Bailey County, is one of many West Texas farmers who have increased cotton yields by putting cotton burs on the land. His irrigated land in 1952 made half a bale to the acre. Then he applied 15 tons of burs to the acre. In 1953 the land produced two bales per acre, in spite of hail that knocked out 20 percent of the crop. Richardson got the burs from M. E. Casey, Casey-Cannon Gin in Maple, Texas, and also applied 300 pounds of 16-20-0 fertilizer per acre before the burs were scattered. Leveled with a harrow, the burs were than irrigated and turned under by deep flat breaking. Wilson figures he made a net of $271 per acre, plus improved land for the next year's crop, before the rent on the land was paid.

• Finland To Buy Cotton

FINLAND will be permitted to buy $2 million worth of surplus cotton and $3 million worth of surplus tobacco with its own currency, Washington has announced. The Finnish funds obtained for the cotton and tobacco will be used by the U.S. to purchase Finnish products.

• Pastel Gams To Show

THE GIRLS will be wearing pastel-colored hose that will show beneath the shorter skirts this spring. That's the prediction of the hosiery industry which is featuring lilac, pink, cornflower blue and pale green shades. "The new nylons are so wispy sheer," say the manufacturers, "that the skin tone subdues the color—leaving only a delectable blush on the legs."

• Area of Production

AREA OF PRODUCTION, the definition of which has given ginners so much trouble in connection with labor costs, continues to cause confusion. A recent Texas Cotton Ginners' Association bulletin points out that the Fifth Circuit U.S. Court of Appeals has ruled that the administrator's definition of area of production is invalid. The court held that the population requirement has nothing to do with the area of production.

This latest court decision is directly in conflict with a previous ruling by the Tenth Circuit Court. The ginners' association policy will be to work to have the latest ruling declared final.

• NCPA Speaker Resigns

CLARENCE MANION, whose selection to address the opening session of the National Cottonseed Products Association convention at Houston was announced in The Press on Jan. 30, has resigned as chairman of the President's Commission on Intergovernmental Relations. Manion, former dean of the Notre Dame Law School, was asked to resign because of differences with the Administration as to the Bricker Amendment, which would curb the President's treaty making power.

• Farmers in Squeeze

ALL FARM PRICE support programs cost the taxpayer only 45 cents annually, but taxpayers are paying 81 cents per capita to subsidize airlines, Texas Commissioner of Agriculture John C. White said in a recent address.

THOMAS L. MOORE, left, Delta & Pine Land Co. sales manager, and Ted R. Stephens, the company's Brownsville, Texas, manager, inspecting a field of Deltapine 15 breeder's registered cotton.

D&PL Cottons Account for Third of 1953 Plantings

USDA figures indicate that more than one-third of the total cotton acreage in the U.S.—or better than eight million acres—was planted to Deltapine 15 and D&PL-Fox in 1953. These two varieties were originated and developed by Delta & Pine Land Co. at Scott, Miss., and are the result of 38 years of experience in scientific seed breeding.

D&PL-Fox was introduced in a limited way in 1950 and has won many friends because of its earliness and rapid fruiting and maturing characteristics. The breeders describe it as a heavy yielder with a moderately high lint turnout. Bolls are rounded and easy to pick by hand or machine. "Fox's thicker fiber results in fewer neps, giving it superior yarn appearance," the company says. Fox was bred to supplement Deltapine 15.

"Deltapine 15's heavy yields and high lint turnout have made it America's most popular variety," a D&PL official points out. "Both Deltapine 15 and D&PL-Fox are easy to pick by hand or machine and have very good manufacturing performance records.

"Delta & Pine Land Co. is constantly improving its seed to meet the demand of tomorrow. For more than 38 years this internationally famous cotton plantation has looked ahead to tomorrow's cotton needs."

In Augusta, March 7-8

Georgia Ginners Plan Program

■ BUSINESS session to start March 8. H. A. Williams will preside. Addresses by industry leaders to be featured.

The Bon Air Hotel, Augusta, Ga., will be the site of the twenty-second annual convention of the Georgia Cotton Ginners' Association March 7-8, with registration beginning in the hotel lobby at 1 p.m. Sunday.

Other activities Sunday include a meeting of officers and directors at 5 p.m. and a social hour sponsored by Georgia oil mills from 6 to 7 p.m. in the Magnolia Room.

Business sessions start at 9:35 a.m. March 8 with President H. A. Wiliams, Jr., Sylvania, presiding. Scheduled for the morning are addresses by J. Ritchie Smith, National Cotton Council, Memphis; H. L. Wingate, president, Georgia Farm Bureau Federation, Macon; and C. C. Murray, dean and director, college of agriculture, University of Georgia, Athens.

The invocation will be given by Rev. T. S. Boehn, Augusta. The mayor of Augusta, Hugh L. Hamilton, will welcome the ginners to the city, and the response will be made by Jack Willis, Ocilla, an Association director.

At noon a luncheon and style show will be held in the ballroom of the hotel. Ladies and gentlemen are invited to attend.

The afternoon business session includes remarks by Tom Murray, Association executive vice-president, Sylvania; an address by Edward J. Wade, vice-president of the New York Cotton Exchange; and an address by Jay C. Stilley, executive vice-president of the National and Texas Cotton Ginners' Associations.

At 3 p.m. an open forum panel will be presented. Moderator will be W. J. Estes, Jr., an Association vice-president, Haralson. Participants include Charles A. Bennett, Cotton Ginning Investigations, Stoneville, Miss.; D. L. Branyon, agronomist, Georgia Extension Service, Athens; J. C. Oglesbee, Jr., Extension cotton ginning specialist, Atlanta; and E. C. Westbrook, agronomist, Georgia Extension Service, Athens.

The annual banquet will be held in the ball room at 7:30 p.m. A. H. Ward, Aiken, S.C., will be toastmaster.

After the style show Monday, a sight seeing tour has been arranged for ladies attending the convention. Mrs. H. A. Williams is chairman of the hostess committee.

Officers and directors include E. J. Swint, Jonesboro, an Association vice-president, and the following directors: John A. Anderson, Macon; W. W. Brinson, Dublin; Dick Chambers, Madison; I. M. Foy, Statesboro; O. S. Garrison, Homer; F. G. Guerry, Montezuma; James C. Mann, Conyers; H. H. Redwine, Fayetteville; Edwin Shiver, Morven; Sam Smith, Cartersville; and P. W. Vaughn, Williamson.

Plans for Texas Gin Schools Made

Plans are being made to hold another series of schools for ginners at Dallas and Sherman, Texas, on the dates of April 19-22 and April 26-29, with detailed information to be announced soon. Gin machinery manufacturers, Texas Cotton Ginners' Association and others are working with Ed Bush, Texas Extension cotton ginning specialist, on plans for a working conference that will be of value to every ginner who attends.

• Monterrey Host to Superintendents

THE FIRST divisional meeting in Mexico of the International Oil Mill Superintendents' Association was held Feb. 25-26-27 at the Ancira Hotel in Monterrey. L. C. Roots, Monterrey, president, was the presiding officer. Other Association officers include W. C. Whittecar, Lubbock, vice-president; and H. E. Wilson, Wharton, Texas, secretary-treasurer.

Listed on the program for the first day were Vulfrano Martinez, president, Monterrey Chamber of Oils, Fats and Soaps; Salvado Rojas, Association vice-president for Mexico; Jorge Martin Ruiz, director, Amerex Engineers; M. C. Verdery, Anderson, Clayton & Co., Houston; W. D. Baldwin, Hercules Powder Co., Wilmington, Del.; Lucian Cole, Industrial Machinery Co., Fort Worth; Dr. John W. Dunning, The V. D. Anderson Co., Cleveland, Ohio; E. B. Free, Abilene, Texas; Whittecar; and Cesar Estrada, Industrial Jabonera "La Esperanza," Gomez Palacio, Mexico.

Speakers scheduled for the second day's session included Charles R. Campbell, Charles R. Campbell Co., Dallas; Enrico Cusi, Aceite Casa, S. A.; Boyce Temple, Fort Worth Steel and Machinery Co., Fort Worth; Carlos Javier Sainz Aldrete, Guadalajara, Mexico; Cecil Wamble, director, Texas Cottonseed Research Laboratory, College Station; and Alfredo Longoria, Nuevo Laredo, Mexico.

Final day's speakers included Jose Elizondo, director, Algodonera y Aceitera Mexican, Monterrey; and R. D. Long, general sales manager, Carver Cotton Gin Co., Memphis.

The program included a number of entertainment features and visits to oilseed processing plants.

M. D. Sims of Buckeye Dies in Memphis

M. D. Sims, division superintendent for Buckeye Cotton Oil Co., died Feb. 9 at his home in Memphis. He had been ill for four months. He was 69.

Sims had been associated with Buckeye for 43 years and had made his home in Memphis 25 years. He was in charge of mills in Alabama, Arkansas, Mississippi and Tennessee.

The superintendent was born in Bullock County, S.C., and was graduated from Clemson College, Clemson, S.C. He was a member of Evergreen Presbyterian Church, Memphis, and a deacon there.

He leaves his wife; three sons, Robert Sims of Garden City, N.Y., Dr. David Sims of Fort Pierce, Fla., and Lt. (jg) Joe S. Sims with the Navy on Guam; his brother, W. T. Sims; and his sister, Mrs. C. L. Kennedy, Sharon, S.C.

LaCour Becomes Official Of Opelousas Bank

Vernon E. LaCour, manager of the agriculture department, Union Planters National Bank, Memphis, has resigned to become a vice-president of the St. Landry Bank & Trust Co., Opelousas, La.

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• Outlook for Cotton In Asia Reviewed

THE COTTON situation in several Asiatic countries is outlined in February reports by USDA's Carl C. Campbell, marketing specialist, who has been in Asia studying the cotton outlook for some time.

• **Japan**—The government is not likely to consider cotton imports under the Mutual Assistance Act until increased food import requirements have been met, Campbell points out.

Cotton consumption for the current year is estimated by the All Japan Cotton Spinners' Association at about 2.4 million bales. "Informed sources consider that the Association's estimate of consumption is a little optimistic," Campbell says. Chief reason is that export demand may be lower than anticipated by the spinners.

Imports into Japan are expected to total 2.2 million bales with 800,000 bales coming from the U.S. Through October 1953 approximately 1.1 million bales had been purchased, 290,000 of which came from the U.S.

• **Hong Kong**—Since Hong Kong is a free money market, the principal consideration in buying cotton is price. Campbell reports that American cotton faces two difficulties there: it is priced above other cotton (Pakistani and Brazilian) which can be used by spinners, and U.S. dollars command a premium on the Hong Kong Exchange whereas other types may be obtained at a discount.

Spinners and merchants like U.S. cotton for its uniformity and for other characteristics, but it appears that they will use it only when the price becomes competitive. At present there are 13 spinning mills in Hong Kong.

• **Thailand**—Japan is expected to continue as the principal supplier of cotton textiles, and no effort to expand the Thailand textile industry is seen. Thailand has two cotton spinning mills, which will need to import about 3,000 bales of cotton this year.

Again, spinners there like American cotton and would probably buy it if it were priced competitively. The 1953 crop harvested in Thailand totaled from 25,000 to 30,000 bales, of which about half will be used for non-spinning uses, or will be spinned by hand.

• **Burma**—Civil distrubances in a considerable portion of Burma have caused trade there to be restricted. Campbell points out that import requirements will probably be below normal for this reason.

The 1937-41 average annual import of cotton yarn and thread was a little over 25 million pounds, and imports of cotton fabric averaged 165 million yards.

This year Burma's one mill plans to import about 3,200 bales of raw cotton from Pakistan, and Campbell points out that U.S. cotton would be considered if the prices were competitive.

The cotton crop harvested in Burma this year is estimated at 84,000 bales. About 325,000 acres were planted in cotton. The government hopes to increase this figure to 600,000 acres, but greater internal stability is needed for the realization of this goal.

• **India**—The government has greatly eased import restrictions on cotton. For the current crop year it is estimated that India will import 635,000 bales of cotton, of which 290,000 are expected to come from the U.S.

In 1952-53, India's cotton inventory dropped by almost 600,000 bales. The 1953-54 crop is expected to be 15 to 20 percent better than last year's, and the harvest is estimated at 3.5 million bales.

Cotton mill production for calendar 1953 is estimated at 1.5 billion pounds of cotton yarn and 4.9 billion yards of cotton fabric. Handloom production is estimated at one billion yards, but Campbell points out that this estimate cannot be checked and may be high.

Domestic consumption of cotton textiles is expected to continue at reasonably high levels. Exports last year were higher than expected. During 1953 India exported 701 million yards of cotton fabric.

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Tom Cook Succeeds Father

TOM COOK has been named sales representative of the Texas-Oklahoma area by the Graton & Knight Co. (Worcester, Mass.) world's largest manufacturer of industrial leather products. He succeeds his father, Harold Cook, who was with Graton & Knight for 38 years as sales representative in the Texas area. He will operate out of the Dallas office, selling the company's line of leather belting, textile leathers and packings of leather and synthetic rubber. Tom Cook was formerly sales manager of the Ben Griffin Truck Center in Dallas. Before that he worked for an oil drilling company in West Texas. After serving as an engineer-gunner in the Air Force, he studied engineering at North Texas Agricultural College and business administration at Southern Methodist University.

Record Sales Prospects Seen by Butler Co.

With grain storage problems almost a sure thing for the coming year, salesmen in the farm equipment division of the Butler Manufacturing Co. were told by management that this could be a bonanza in reaching record sales goals for 1954. This and other optimistic notes were brought out during a recent three-day general sales meeting at Kansas City. With Butler's biggest year behind them ($49,700,000 in shipments) company officials were already training their sights on a 10 percent bigger one, "and that's a modest figure," declared General Sales Manager Harold Edlund.

USDA's on-the-farm storage problems should make this Butler's biggest year in the grain bin, grain storage tank and grain storage building business, said Treasurer Barius Melcher. Management anticipates similar sales increases in steel buildings, and dry cleaning and oil equipment divisions.

Highlighting the first large-scale sales conference since 1948 was a two-hour-long Butler Products Revue in the arena of the Municipal Auditorium when professional actors, a band and quartette showed what it's going to take to improve Butler sales in increasingly competitive times.

Other types of farm equipment included a corn crib, hay and grain elevators, hog feeders, stock tanks, grain dryer, watering fountain, auger loader, and stock tank heater.

• Riepma Comments on Sales of Butter

THE POSITION of the margarine industry as to disposal of surplus butter has been outlined by S. F. Riepma, president, National Association of Margarine Manufacturers. In a letter to the Secretary of Agriculture, written on Feb. 12 which was before the announcement that butter price supports would be reduced to 75 percent of parity for the market year beginning April 1, Riepma said:

"I understand from a press item that you have stated the margarine industry has no objection to the subsidized price disposal of butter. Unfortunately its position cannot be stated in such categorized terms.

"Our industry recognizes the problem with which you are confronted. You have not consulted us, but we do wish to be constructive. We believe food should be made to be eaten and not stored. We protest, however, against butter disposal plans that cannot possibly be fair to all consumers, that are urged to purposefully injure margarine, and that establish the government as the loss merchandiser of one farm product to the injury of another. Such proposals are temporary expedients and do not solve the butter surplus problem.

"You undoubtedly recognize that the disposal of 260 million pounds of surplus butter at prices designed to make that amount of butter sell, would probably destroy a substantial part of margarine's markets. Despite this, our industry would reluctantly accept the temporary destruction of this market if it would solve the consumers' and farmers' problem that is involved. All we have ever wanted is fair competition. Unfortunately, the dump-butter policy by itself does not offer more than a temporary palliative of which we are singled out to bear the greatest burden. Clearing the warehouse shelves of butter only to start filling them again would be no solution to the butter surplus problem.

"You, yourself, among others, have pointed out that the butter surplus merely reflects the need for producing more milk for use in its more profitable and nutritionally needed form—fluid milk, ice cream, etc.—in preference to butter, which is of course, the least profitable dairy product. Our industry has frequently emphasized that the money saved by buying margarine is a well-spent bonus when applied to the purchase of whole milk.

"Dumping of tax-bought butter at tax-subsidized prices, sets a precedent dangerous to all concerned. It does not solve the butter problem. It does not give Mrs. Consumer what she wants the way she wants it—through fair competition at the grocery store. It establishes a policy whereby the government employs its powers and the taxpayers' money to promote butter to the injury of margarine and the farmers raising cotton and soybeans. Congress voted against this kind of discrimination when it repealed anti-margarine taxes in 1950.

"These considerations, of course, are made quite apart from the subject of farm price supports. We believe that the program should be revised so that the present dilemma will not arise in the future.

"Our industry will appreciate your giving these comments your careful consideration. We shall continue to sell margarine on its merits, and to give Mrs. Consumer a table spread as nutritious as any, at the lowest possible competitive prices."

Conservation Cooperation Urged in Missouri

The soil conservation committee of the Missouri Cotton Producers' Association has completed its annual examination of soil conservation problems in Missouri's Delta area. Roger Rhodes, Gideon, is committee chairman.

The committee has recommended that all groups and agencies interested in soil conservation and soil building programs become more closely integrated so as to provide maximum benefits from the funds expended.

Textile Export Rule Changes in Spain

Under new regulations, Spanish exporters of cotton and rayon textiles have been barred from using foreign exchange earned through exports for the importation of raw cotton at world market prices. All foreign exchange from textile exports now must be turned over to the Spanish Foreign Exchange Institute, which pays the exporters in Spanish pesetas.

To encourage exports, the government has set up machinery which allows manufacturer-exporters to purchase raw cottons from the National Cotton Center at prices only slightly above the world market price. Regular domestic prices in Spain are about 50 percent above the world figure.

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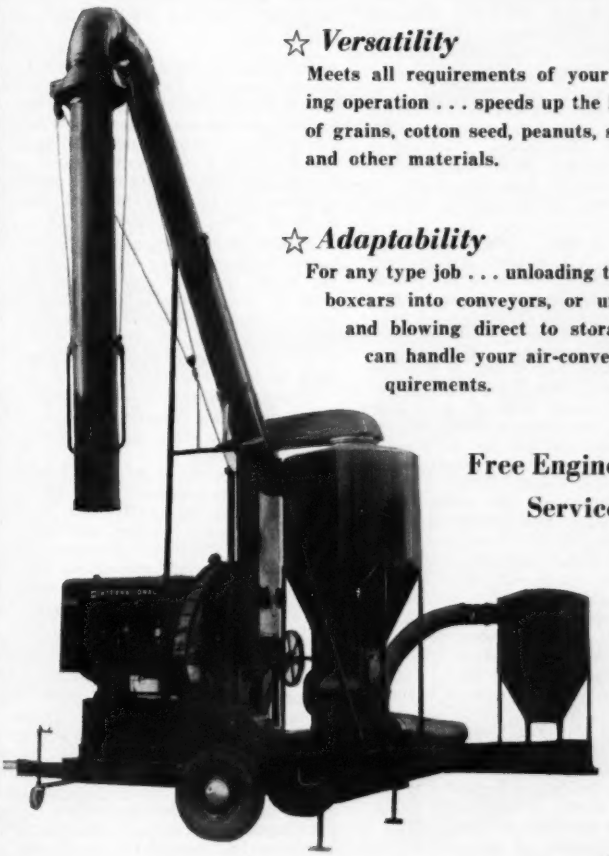

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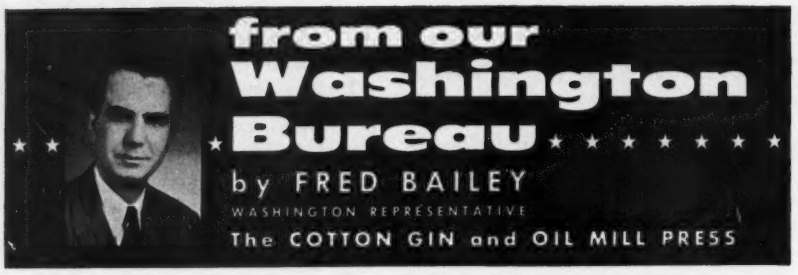

• **Butter Subsidy Planned**—There were unmistakable portents at USDA, as this issue went to press, that officials were about to come up with a plan for subsidizing disposal of some butter stocks. Officials were tight-lipped on what the plan might be, but there was little question there would be one—perhaps to become known before you read this.

The timing was considered by Administration strategists to be just about right. The dairyman was hot over official announcement that his price support, starting April 1, would be cut down to the legal minimum of 75 percent of parity. It was hoped by officials that follow-up announcement of a dairy disposal plan would reduce the irritation of dairy interests.

What the disposal plan would be was the $64 question. But something along the lines of the idea put forward by the National Milk Producers Federation looked like a fair bet. It would be costly to taxpayers, but it had the merit of requiring no new legislation to be put into motion.

The notion, in brief, would be for the government to sell butter stocks back to the trade at about 30 cents per pound. This, then, would be put on the market with current supplies at a blended price to the housewife of about 57½ cents.

• **Price Cut May Not Help**—When Agriculture Secretary Benson told correspondents that lower support for butter would mean more consumption, he was reckoning without margarine. Retail butter prices last year were well under those of 1952—in some months 10 percent lower, just about the price reduction expected when new butter supports go into effect April 1.

But what happened to butter consumption in the two years, 1952-53? Fact is that it was exactly the same, 8.6 pounds per person, despite the lower prices last year. Veteran market researchers at USDA say that consumption in 1953, normally, would have gone up . . . about one percentage point with each percentage drop in the retail price.

The reason it did not, they believe, is due to the "new" factor—the large increase in margarine sales. In future months, unless margarine sales have already pretty much leveled out, butter may be in no greater demand than it has been—regardless of the anticipated retail price drop of about eight cents per pound.

• **Cotton Exports**—The export outlook for cotton is sort of sad and happy, at one and the same time. Free world production, officials say, "will almost certainly set a new postwar record." Consumption and price trends, on the other hand, give some reason for optimism.

Free world production this season, late figures show, will be about 29.4 million bales, an increase of half a million above last season. Supplies are to be about 45 million bales, compared with 42 million a year ago.

The larger amount is due to this country's mounting stocks that comprise 51 percent of the free world total. On the plus side was the fact that consumption, when the last official figures were reviewed, was still running about five percent better than the 1951-52 season. In recent weeks prices have been firmer in both dollar-short nations, and in the U.S. where the fiber has been going under government loan at a rapid rate.

Consumption this year, it is concluded, should exceed last season—and maybe "approach the 26.5 million-bale record of 1950-51."

• **Surplus Problems** — It's "threshing season" here for farm leaders . . . time to separate the wheat from the chaff. The oversupply of the latter in Washington can make planning tough and slow down decisions, but old hands here advise: Surest guide in coming weeks and months is what the government does (not what it says) about surpluses.

Action on huge stocks in government's hands holds the key to the future. Best bet now, say officials privately, is to plan on heavy supplies for some time to come. They warn against putting much store in outcome of feverish debate over the future level of government price help to farmers.

The price debate is exaggerated in the press. Benson's "flexible" supports would no more than dent present food stocks, say economists.

More exports can help, but won't solve surplus problem, say experts here. Legislation to cut tariffs and spur world trade . . . being worked out with White House by steelman Clarence Randall . . . will meet stiff opposition on Capitol Hill. The Administration, meanwhile, plans full use of present powers to move surpluses into foreign areas.

• **"Recession" Now Respectable** — "Recession" is no longer a dirty word in Washington. President Eisenhower has given it new respectability. His use of it, publicly and pointedly at a recent press conference, was no accident. It represents a major White House effort to dispel the head-in-sand approach of some politicians to the country's economic problems. You can look for further Administration moves to make the lesson stick.

The Chief Executive wasn't fooling when he said that quick action would be taken in March unless there was improvement in the employment picture. If unemployment grows, it will be a danger signal to farmers. Big unemployment means slack demand.

• Eight percent of the U.S. population is employed in growing, processing, manufacturing or selling cotton and its products.

To Be Held March 2-3

Ginners' Schools Plans Complete

■ **MIDSOUTH gin operators will be given practical training in use of all equipment in modern plants by experienced personnel.**

Plans have been completed for the Midsouth Cotton Gin Operators Schools with indications that there will be a large attendance at the schools March 2-3 in Memphis and nearby.

Louisiana Delta Council set a goal of at least 50 registrations from gins of that state, Mississippi Delta Council set up attendance committees to encourage participation from the area, and sponsors in Arkansas, Tennessee and Missouri were actively working to assure maximum attendance from gins in those states.

All schools will be held from 9 a.m. to 5 p.m. on March 2-3. Locations of the schools will be as follows:

Continental Gin Co. School at 212 Poplar Street, Memphis.

Murray-Mitchell Gin School at 146 East Butler Street, Memphis.

Lummus Cotton Gin Co. School at 234 East Butler Street, Memphis.

Hardwicke-Etter Gin Co. School at The Cowart Gin Co., Inc., nine miles west of Charleston, Miss., on Highway 32 (14 miles east of Webb, Miss., on Highway 32).

Sponsoring organizations, which include gin machinery manufacturers, ginners' associations, Extension Services, the two Delta Councils and USDA, urge every Midsouth ginner who can do so to take advantage of the opportunity for getting up-to-date information provided by these schools. There is no charge for the schools, and the instruction will help any gin operator to do a better job of ginning higher grade cotton in 1954, the sponsors emphasize.

• Memphis Will Have Emulsifier Plant

AN EMULSIFIER PLANT, using fats and oils, will be constructed in Memphis, starting next month, it has been announced by Ralph K. Gottshall, president, Atlas Powder Co., Wilmington, Del. The plant will be built on a tract adjacent to the Trendex Division plant of the HumKo Co.

Emulsifiers produced by the new plant are mono and diglycerides for use in such food products as bakery goods, margarine, shortening, candy and ice cream, and non-food products which include cosmetics and pharmaceuticals.

Atlas will make the emulsifiers by combining fats and oils with glycerin or sorbitol. Output of the plant will be handled by the Food Industry Division of Atlas' Chemicals Department. The operation will provide a new outlet for millions of pounds of fats and oils from Southern farms. HumKo, a subsidiary of National Dairy Products Corp., will supply raw materials to be used in the plant.

The plant will employ about 50 technicians and other workers.

At Oklahoma City

Oklahoma Ginners Complete Plans

■ MARCH 2-3 convention will feature talks by Stroup, Haynes, Tomlinson, Horne, Darlow, Ross, Cunningham and others.

Oklahoma cotton ginners will convene in Oklahoma City March 2-3 for their annual convention, which will meet at the Biltmore Hotel.

Registration will start at 9:30 a.m. March 2 and the first business session will open at 1 p.m. in the West Lounge of the hotel, according to J. D. Fleming, secretary-treasurer.

W. E. Rosenbum, Hugo, president of the Association, will address the convention, followed by Max Berry, state secretary of the Future Farmers of America, Stillwater, whose topic will be Research and Education—the Keys to Agricultural Progress.

George Stroup, Extension cotton specialist, and Gaylord Haynes, assistant Extension agronomist, both of Oklahoma A. & M. College, Stillwater, are scheduled to discuss the educational program for cotton production.

Jim Tomlinson, farm coordinator, Experiment Station, Stillwater, will report on progress made at the pilot demonstration farms; and M. K. Horne, chief economist, National Cotton Council, Memphis, will talk about utilization of cotton, and cotton markets.

An Agricultural Program for Oklahoma is the title of an address to be given by A. E. Darlow, vice-president and dean, school of agriculture, Oklahoma A. & M. College, Stillwater.

Dinner Tuesday night will feature introduction of winners of the 4-H Club and Future Farmers of America cotton production projects.

The Wednesday, March 3, meeting will start at 9:30 a.m. with committee reports. John E. Ross, Jr., economist, USDA, Stoneville, Miss., is scheduled to discuss the effects of lint cleaners in Western Oklahoma on bale values and spinning properties of cotton.

Progress at the Sandyland Station at Mangum will be described by Thomas J. Cunningham, superintendent.

The meeting will adjourn at noon following a report by Fleming.

Officers, in addition to Rosenbum and Fleming, are Elmer Dawson, Mt. View, first vice-president, and M. N. Pannell, Lawton, second vice-president.

• Midsouth Gin Exhibit Progressing Well

ANYONE desiring space at the Midsouth Gin Supply Exhibit in Memphis March 18-19-20 should get in touch with W. Kemper Bruton, executive vice-president, Arkansas-Missouri Cotton Ginners' Association, P. O. Box 345, Blytheville, Ark.

Plans for the exhibit are coming along well, Bruton says. The supply show will run concurrently with the conventions of the Arkansas-Missouri and the Tennessee ginners.

Cattle Bloat Study Looks Promising

That ancient enemy of cattle—bloat—is the target of an all-out attack by scientists and the cattle industry. Initial research includes the discovery that saponins or associated substances in alfalfa are one cause of the ailment.

Administering saponin to animals through a stomach tube, workers at the Western Regional Research Laboratory found that it caused distension of the rumin in 8 out of 10 cases. In all cases, distension appeared due to gas retention rather than froth.

"Final victory may be a long way off," says a USDA publication, "but the research on saponins indicates that we're on the right track in the chemical approach to knocking out bloat."

• Plains 4-H Cotton Prizes Awarded

WINNERS in Texas' 4-H Club District 2 cotton contest were presented awards at a luncheon at Plains Cooperative Oil Mill, Lubbock, Feb. 13.

G. L. Jackson, president of the oil mill board of directors, and Roy B. Davis, manager, participated in the presentation.

First place winner in the irrigated division was W. R. Herring, Crosbyton, who produced 6,425 pounds of lint on his five-acre plot. Herring's prize money totaled $700—$250 as first place winner in the Plains mill district contest; $200 as winner in the Crosby County contest; and $250 as winner in the community contest sponsored by the gin at Cone.

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• Western Producers To Hold Meeting

LATEST techniques of producing cotton in the arid Western section of the U.S. will be in the spotlight on April 13-14 at Phoenix, where approximately 400 experts will gather for the third annual Western Cotton Production Conference.

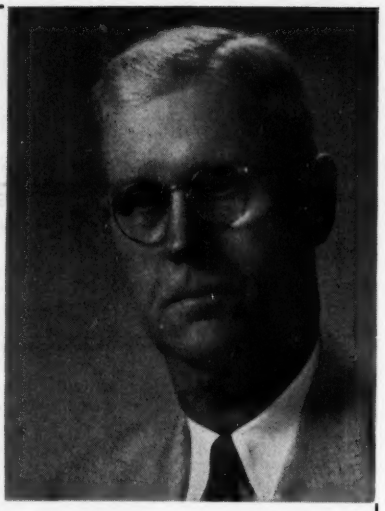
Announcement of the meeting was made by E. S. McSweeney, executive secretary of the Arizona Cotton Growers' Association.

Cotton diseases, insect control, weed control, and defoliation practices will be discussed from the viewpoint of the Western area. Key representatives of USDA, Western land grant colleges, industrial organizations and the cotton industry will take part in the program.

The two-day meeting will consist of four half-day sessions, each concerned with one of the principal production phases. The conference is sponsored jointly by the Arizona Cotton Growers' Association, host to the meeting; Five States Cotton Growers' Association; and the National Cotton Council.

All persons and organizations interested in any phase of Western cotton production are urged to attend, McSweeney said. The Western area usually is defined—relative to cotton production —as Arizona, California, New Mexico, the El Paso area of Texas and Nevada.

Ginner's Experience Benefits Industry



By GEORGE T. HIDER

President, National Cotton Ginners' Association

■ THE WHOLE cotton industry can benefit from the ginners' experience and knowledge. He, in turn, needs to know the problems of the handlers and processors.

Experience has taught the ginner that frequently he will be criticized for poor lint samples submitted to the buyer. Regardless of the many factors governing the sample's quality, some of them entirely beyond the ginner's control, he often is blamed. The ginner has gained this knowledge by hard experience. He should use it to help himself and the whole cotton industry by protecting or improving the quality of the cotton passing through his gin.

The ginner is in close contact with the producer and has an excellent opportunity for encouraging the production of seed cotton suitable for satisfactory ginning. When a load of good seed cotton delivered to the gin has been separated into good lint and clean seed and forwarded to the compress and the oil mill, the ginner's local work is done.

However, the National Cotton Ginners' Association, through its representatives at conferences of delegates from the interested industries, gives its members the opportunity to know the problems of the entire industry and to contribute a share in the production of better cotton products.

Animal Agriculture Urged To Aid Surplus Problem

Grain surpluses could be cut by allowing animal agriculture to flourish, says Homer R. Davison, vice-president of the American Meat Institute.

"With the export market all but evaporated, we're faced with the task of redesigning our agricultural plant to fit the size of our market. Some say that our plant is too big now—that it should be made smaller. But wouldn't it be better to expand the plant even further—producing more meat and protein foods that could be sold rather than accumulating grain in storage where it isn't wanted?"

Davison, speaking before a meeting of the Pacific Northwest Farm Forum, pointed out that an animal agriculture would have a tendency to divert acres from cotton, tobacco and wheat back to grassland. Thus, he said, production of crops with the greatest surpluses now could be reduced.

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Fertilizer Requirements

(Continued from Page 32)

form a ridge or raised bed over the fertilizer and plant the seed about ten days later.

"A part of the nitrogen is usually applied as side dressing when the plants are 8 to 10 inches tall. There is likely to be less loss by leaching, particularly on sandy soils, when a part of the nitrogen is applied as side dressing. Side application of additional potash on low-potash soils is often practiced, and owing to lack of suitable placement equipment it is, in most instances, the only satisfactory method of supplying sufficient potash. All of the potash might well be applied at time of planting if high-potash fertilizer could be properly placed. Fertilizer materials can be applied as side dressing during cultivation by means of attachments on either wheel-type or tractor-mounted cultivators. The material is delivered through a tube fastened behind the inside shovel on either one or both sides of the row."

No Other Out

The handwriting is on the wall. With less acres, cotton farmers must make more money per acre if they are to maintain income and net profits. This means more fertilizer per acre, more care in planting and harvesting the crop . . . more efficient farming, if you please.

• Cotton gains about 25 percent in strength when wet, thus contrasting with animal and synthetic fibers which lose strength as moisture increases.

Adaptation of Cotton to Mechanical Production

(Continued from Page 28)

ed by irrigation or natural rainfall the plant may actually fall to the ground. High winds at this stage of development certainly would aggravate the situation. In California, and perhaps elsewhere, topping has been practiced on a limited scale in an attempt to reduce lodging. Since topping in most cases causes a reduction in yield it is hoped that research on stalk stiffness and cultural practices will make it possible to avoid topping entirely.

Ever since the advent of the boll weevil, cotton breeders have placed considerable selection pressure on earliness of fruiting. Attention also has been given to a more determinate fruiting habit. As a result, modern upland varieties are quite early in comparison to types commonly grown before the turn of the century. To obtain the "bunch" crop (i.e., early maturing bolls borne well off the ground and a shortened maturity period) so highly desired for spindle-type picking will require a bit of "doing" by the cotton breeder. Improvements in any one of these factors usually are made at the expense of maximum yield. And since the cotton plant sets its bolls the way it does, a high set of fruit is usually not associated with earliness. However, by making concessions here and there, it should be possible to breed a type with a better combination of these characters than has been produced so far. Cotton breeders are placing a lot of emphasis on this phase of the work.

At the Texas Station we have found a boll type in the progeny of a cotton hybrid in which the locks are closely held and, at the same time, appear to fluff sufficiently to be engaged by the spindles of a mechanical picker. We also have an experimental strain in early stages of testing which is slightly "dwarfy" in growth habit. Apparently because of an accelerated rate of boll production, it seems to be able to compete with regular commercial varieties in yield. Such types may help solve some of the problems of storm resistance and earliness in cotton to be harvested mechanically.

A significant amount of breeding work has been done on the reduction of leaf and bract trash in harvested cotton. Some years ago a strain was developed at the Mississippi Delta Branch Station which was relatively free of the leaf hairs which are a common characteristic of regular upland cotton. This strain was first developed for resistance to the cotton aphid, but its value in producing cleaner machine picked cotton was soon apparent. Unfortunately, the strain was a relatively poor yielder and was never placed in commercial production. Recently another promising smooth-leaf type was discovered at this same station in the progeny of a species hybrid. Attempts are being made to transfer the character to a productive upland stock. The bracts or, strictly speaking, bracteoles, are modified leaves at the base of cotton bolls. These bracts are one of the principal sources of trash in machine harvested cotton. Plant breeders at several locations in the Cotton Belt have worked with a mutant type or sport called "deciduous bract," so named because the bracts dry up and fall off as the boll matures. This bract character causes, or is associated with, other plant abnormalities and has not led to the production of an acceptable agronomic strain. At the North Carolina Station an attempt is being made to transfer the small, narrow bract, found in a geographic race of cotton closely related to American upland, to one of our better commercial varieties.

The properties of the cotton fiber, particularly length and fineness, have a definite relationship to the extent to which foreign matter can be removed during the ginning. At the Texas Station we have been able to establish a number of different fiber types from species hybrid material. As the work of incorporating these new types into acceptable commercial lines progresses, we expect to test their ability to "clean-up" at the gin.

In areas such as the High Plains of Texas, where the stripper has definitely demonstrated its adaptability and where it has been possible to produce varieties especially adapted to the stripper, we have an excellent example of a close approach to complete mechanization of cotton.

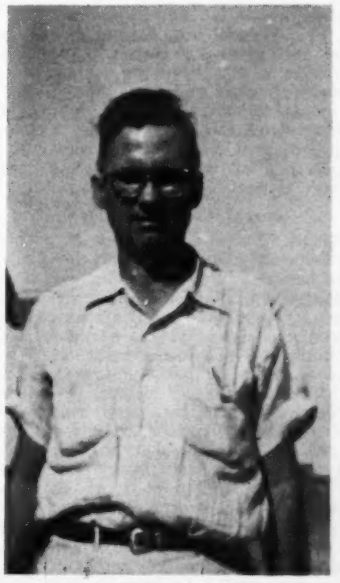
In the early thirties, engineers at the Texas station pioneered the development of the mechanical stripper. Concurrently plant breeders at the Station undertook to develop an upright plant type with bolls borne near the central stalk

Prominent Arkansas Ginner and Farmer, R. E. Cox, Says:

"Out of the four gins which I have an interest in, we have installed the Moss Lint Cleaner in two of them, and orders have been placed for Moss machines to go in the other two plants.

"At our plant at Bassett, Arkansas this season with 12 cylinders of overhead cleaning, 10′ Bur Machine and a 14 shelf Tower Drier, we were able to meet our competition which had twice as much overhead equipment.

"The installation at Bassett was made during the ginning season. The machine was easily installed without any interruption of the ginning operation."



R. E. COX
Bassett, Arkansas

Moss Lint Cleaner

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on short fruiting branches. The idea was that such a type would be more suitable for stripper harvesting than normal, open-branched varieties. Due to excessive shedding and the fact that the bolls were set too close to the main stem of the plant, breeding work was discontinued on this particular stock. But research on both the stripping machine and plants adapted to stripper harvesting continued at a rapid pace. A peculiar boll type, in which the locks of cotton are closely held in burs which open only partially at maturity, was found in a field of half and half cotton by H. A. Macha, a farmer in the Lubbock area, some 20 years ago. This "stormproof" character, along with the semi-cluster fruiting habit, has been used extensively in the breeding program at the Lubbock Experiment Station. At the Chillicothe Station a modification of the character was used to produce a variety now grown widely by farmers in the area. Workers at the Oklahoma Station have made outstanding contributions both to the development of better stripping machines and to specially adapted strains. Various expressions of the "stormproof" character have been found in a number of different cotton stocks by private and institutional breeders. These have led in many cases to the development of commercial varieties well adapted to mechanical stripping.

While the "stormproof" boll type and the semi-cluster fruiting habit have contributed greatly to the success of the stripper, many other refinements and improvements are needed to increase the efficiency of the machine. Many of these characters such as high fruit set, earliness, ease of defoliation, etc., have been discussed in connection with the mechanical picker. Bacterial blight or the angular leaf-spot disease is one of the most serious problems now facing the mechanical production of "stormproof" cotton. The disease not only affects the leaves and stems of cotton plants but attacks bolls, often causing stained lint. Sources of resistance to this disease are available and, from the results of breeding work now in progress, we can predict reasonable control through the transference of resistance to approved commercial varieties.

General Considerations

Present cultivated varieties of cotton have been sifted rather closely for characters believed to be especially useful in mechanized production. Although there are many important applications of the variations observed yet to be made, the possibility of obtaining relatively extreme changes in plant characteristics within the cultivated cottons is rather remote. Fortunately, we need not be restricted to the cultivated, upland cottons for new or specialized types. The recently developed "colchicine" technique for doubling the number of chromosomes in sterile cotton hybrids and thus producing fertility, has opened up a vast and relatively unexplored reservoir of specialized cotton characters. Useful characters carried in certain wild and primitive species may now be incorporated in upland stocks by appropriate plant breeding methods. Arizona wild cotton *Gossypium thurberi* appears to be somewhat more cold tolerant than normal, cultivated cottons. Think how valuable this characteristic would be in upland cotton seedlings during unseasonable periods often encountered. A thorough survey of the entire cotton genus might reveal types which are resistant to many seedling diseases, types which produce their first or seed leaves higher above the ground level (or as our farmers say, "shank up"), and numerous other characters which would improve seed germination and maintain stands under adverse environmental conditions. A thorough study of the problem and a correspondingly careful study of available cotton types might reveal differences in the response of certain cotton strains to different methods of cultivation.

Possibilities for improvement or modification of harvesting characteristics are by no means exhausted. Further studies should be made of the relationship of plant structure, arrangements of bolls, structure of the bolls (carpels), fluffiness of seed cotton, storm resistance, etc., to different types of harvesting. It should be pointed out that, as new principles of cotton harvesting are developed, plant characters which heretofore have been considered useless may prove to be highly desirable. The problem of obtaining cleaner picked cotton and higher grades in mechanically harvested cotton will continue to be important.

In trying to establish a specified plant character in a commercial strain, it usually happens that other essential characters are affected adversely; as mentioned earlier, more often than not one of the characters affected is yield. A careful economic analysis is necessary before we can determine how much yield can be sacrificed for a given special character, but it is safe to say that the sacrifice can not be great.

Though developments in the field of cotton mechanization have been truly amazing, the materials, methods and machines available to farmers a generation from now may, by comparison, make present systems and models seem crude indeed. Of course, it is possible that some completely revolutionary machine may be invented or a new biological principle discovered. What is more likely to happen is a continuous series of small improvements resulting from the application of science and technology to each problem as it arises. The job will require a lot of hard work and cooperation on the part of everybody concerned, including the plant breeder. In fact, the pressure on plant breeders to "modify the cotton plant to suit the machine" is increasing. Cotton breeders have a real responsibility in this connection and most of us are trying to live up to it.

Seven-Step Program Increases Output

By J. H. FOX

President, Texas Cottonseed Crushers' Association

■ TODAY, profitable cotton production is a scientific business requiring a big investment and a tremendous amount of know-how. To be successful, growers must produce high acre yields of quality cotton, efficiently.

In 1945, the 7-Step Cotton Program was presented, and it provided farm leaders with a sound program they were willing to back. As a result of the splendid cooperation of all groups, acre yields have been increased 13 percent. The average lint yield in Texas for the period 1946-53 was 192 pounds, as compared to 170 pounds for the previous eight years.

The 7-Step Cotton Program—(1) Fit Cotton into Balanced Farming, (2) Take Care of Your Soil, (3) Get Together on the Best Variety, (4) Make Your Labor Count, (5) Control Insects and Diseases, (6) Pick and Gin for High Grade, (7) Sell for Grade, Staple, and Variety Value—**embodies a combination of production practices that have proved their value in helping farmers produce cotton more efficiently and profitably.**

Our Association has long advocated the use of all practices needed to produce high acre yields more economically.

We will continue our efforts to help **strengthen** and **support** all of the practices included in the 7-Step Cotton Program at the farm, community, county and state levels.

More Boll Weevils Found Hibernating in Georgia

Fall examinations of surface trash in Georgia indicated that more boll weevils entered hibernation than in other recent years, USDA reports. Counts made in three regions of the state showed an average of 1,984 live weevils per acre of surface trash. This compared with 1,346 weevils in the fall of 1952, and USDA comments that weevils have increased at the rate of about 500 per acre for each of the last three years.

Maximum number of weevils per acre found on one farm was 15,488 in Gordon County. At least one farm in each county where inspections were made showed over 5,000 weevils per acre.

Samples from the same counties will be examined this spring to determine the winter survival of weevils.

RESEARCH ....BRIEFS

Nation's Water Problems Mount

■ Water problems, more and more, are attracting the attention of Washington officials, and research men across the country. They came in for major discussion Feb. 23-25 at the New Orleans meeting of the National Association of Soil Conservation Districts. For the first time, last year, the districts' organization established a research committee—and field groups were named to report on needs for scientific study in soil and water problems. This year the committee reviewed needs . . . decided watershed research was of first importance. Great emphasis, too, the committee thinks, should be put upon the "economics of conservation." Thought is that if a farmer knows the dollar-cents payoff of various water and soils practices, he will put more of them to work on the land.

"Probably most of all, we need to get on top of our water supply problems," says USDA's soils-water research boss, Dr. Bob Salter. "Every state has such problems. The interests of industry as well as of agriculture are directly involved. As we try to irrigate more—and the recent increases have been sensational—we run into new problem after new problem—not merely where to get the water and how much to apply and when, but also how to use it and get rid of it without ruining the soil through erosion, water-logging, accumulation of salts, and so on. In many areas, the lowering of water tables is causing a great deal of worry . . . . In my opinion, we must face up to the water problem of the nation and do it fast. We researchers are lagging behind public opinion in this matter. . . ."

* * *

SALTER'S WARNING is underlined by reports from weather researchers on moisture conditions across the country. In the Plains area moisture is now only about one-fourth of normal, with Missouri hardest hit. Other extra-dry areas where serious drouth threatens include Iowa, Nebraska, large parts of Texas, South Dakota, Kansas, Oklahoma, Colorado and New Mexico. Rainfall since last summer is the lowest on record, except for 1930, from Ohio to the western Great Plains. Snowfall in the southern Rockies is 25 to 50 percent short of normal, pointing to possible water shortages for irrigated areas.

* * *

More $$$ for Research

■ Benson, with strong backing from the National Cotton Council, is asking Congress for about a 15-percent increase in research funds next fiscal year. He is seeking a 10 percent cut in his department budget, over all, but is raising the ante for his two favorites, research and education.

The Secretary wants $19½ million for federal payments to assist research work at State Experiment Stations. That's about $6 million more than was voted for this fiscal year. Benson seeks $35¼ million to carry on federal research, an increase of about $2½ million. He wants, in addition to that, $10¼ million for marketing research, compared with $8¾ million in the current year.

* * *

COMFORTING THOUGHT for the week: Research into the effects of electricity reveal that it does not really kill you at all—it's the nervous shock, not the jolt.

* * *

Margarine on "Plentiful" List

■ Market researchers at USDA report that grapefruit and potatoes top the official list of "plentiful foods" to be pushed in March. Others include margarine, beef, broiler-fryer chickens, eggs, dairy products, dry pinto beans, shortenings, salad or cooking oils, onions, peanuts, and peanut butter.

* * *

Coffee To Stay High

■ Don't look for coffee prices to come down soon. Research men will tell you that antiquated unscientific methods of production are nearer the root of the problem than "manipulation" by speculators. Sky-high coffee is expected to lead to intense research for substitutes and blends to capture the coffee market.

* * *

COASTAL BERMUDA grass is being plugged for use in raising Southern beef following tests over a long period.

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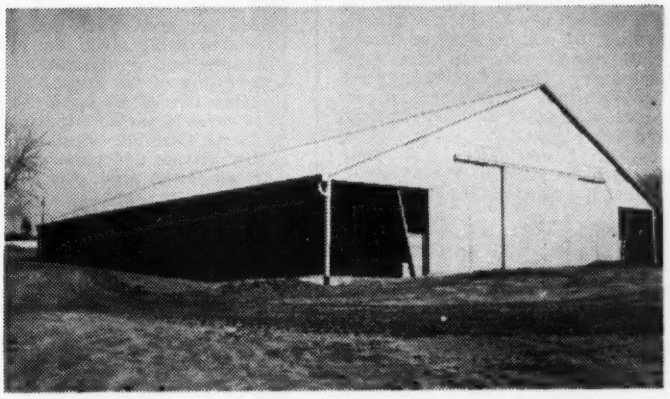

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Council Programs

(Continued from Page 26)

strippers available to harvest more than 30 percent of a 15-million-bale crop. What this means in terms of saving labor is readily seen when you consider that the average human picker uses nearly 100 hours to harvest a bale of cotton. A mechanical picker can do the job in a little over an hour.

Most of us think of mechanical harvesting only as a device to lower production costs. Wm. Rhea Blake, executive vice-president of the Council, pointed out recently:

"Down to now, we have been prone to concede that this gain in economy brought some offsetting loss in quality. But looking ahead, I don't think this point of view is going to last. There is a great quality advantage in getting the cotton out of the field early and fast. Moreover, the mechanical harvester is putting in motion a wave of interest all over the Belt in real mechanical training for the people who run farm and gin machinery. The machines themselves will continue to improve and to become more adaptable to every kind of farm and every sort of weather. It is just a matter of time until the mechanical picker will be given universal credit for a big net improvement in the quality of cotton."

At the Council-sponsored seventh annual Beltwide Mechanization Conference in Gadsden, Ala., last October it was brought out that more opportunity should be given to smaller cotton farmers to mechanize through a program of long-term financing, geared to their needs.

Turning away from machines a moment, no problem gives the cotton industry more trouble, year in and year out, than that of controlling insects. Insects not only threaten production and profits, but lint quality as well.

Through the years the Council, with cooperation from many other organizations, has brought all phases of this problem to the attention of farmers, legislators, agricultural officials, and other persons concerned with the welfare of the cotton industry.

Specifically, last year the Production and Marketing Division reviewed plans for expanding research on the pink bollworm, spread of which poses a threat to U.S. cotton production. Many of these plans became realities in 1953, as outlined elsewhere in this issue of The Cotton Gin and Oil Mill Press.

In December 1953, the Council brought together several hundred leaders in cotton insect control work—entomologists, chemical manufacturers, trade publicists, farmers, educators, and equipment manufacturers—to comprise the seventh annual Beltwide Cotton Insect Control Conference.

Subjects under discussion included the possibility that insect control can aid farmers in fitting cotton into a balanced farming program, latest developments in systemic insecticides, development of insect resistance to insecticides, research highlights of 1953, the pink bollworm situation and observations and experiences with insect control reported from every part of the Belt.

The Council's function in mechanization and insect control has been duplicated in all other phases of cotton production. Besides sponsoring still another conference—attended by several hundred technicians and producers—the Council published 12,000 copies of basic guides to follow in defoliating cotton with chemicals.

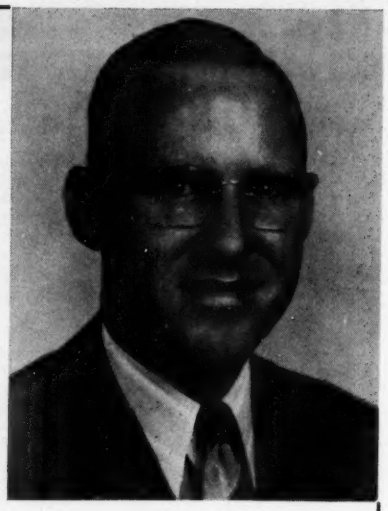
Booklets, brochures and folders are revised and published from time to time also on cotton diseases, insect control, and specific problems that demand education—such as tar spots in finished fabrics and fire prevention at the gin and on the farm.

In accordance with long-standing policy, the Council's educational efforts in production and marketing have been aimed at assisting cotton producers through established educational organizations.

Within the Cotton Belt, vocational teachers give instruction to about 150,000 out-of-school adult farmers, enrolled in night classes, and some 40,000 veterans participating in the institutional-on-farm training program.

In efforts to provide basic teaching

Higher Per Acre Yields Needed



By W. T. MELVIN

President, North Carolina Cottonseed Crushers' Association

■ NORTH CAROLINA ranks high in average yields of cotton per acre. These high yields have been achieved by intensive application of good practices to relatively small acreages per farm. The record is good; but even higher acre yields are needed in 1954 for North Carolina farmers to secure the maximum net income from the reduced cotton acreage.

Research and farm experience have proved that it is possible and practical for North Carolina farmers to produce a bale of cotton or more per acre. Such yields can be made by using all of the practices that have proved their value—starting with the initial preparation of the land and following through to the final harvesting of the crop. No single practice, alone, will do the job; but the combination of all approved practices is the key to the greater production and revenue per acre that cotton farmers need in 1954.

North Carolina cottonseed crushers and ginners have always worked with other private and public organizations of the state toward the goal of improved cotton production. In 1954, however, they are faced with a greater challenge and greater opportunity than ever before. Through their individual efforts and the influence of their industry organizations, ginners and crushers can and must exert every effort to encourage farmers to follow a complete program of better production practices this season.

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materials on cotton, the Council has prepared detailed reference sets on most of the major phases of cotton production and marketing. These are distributed to state vocational agriculture supervisors, thence to individual teachers, well in advance of the cotton season.

Marketing Problems

Problems in marketing are just as numerous, just as varied and just as complex as those in production. And Council staff members emphasize that each one has an important bearing on the entire industry's efficiency and competitive position.

Preserving quality in ginning, finding a new protective package for the bale, eliminating sources of contamination, and preventing fires, challenge the thinking and initiative of entire segments of the industry.

Again, as a means of increasing understanding of mutual problems, representatives of two groups were brought together last month. This time they were ginners and spinners. Ginner representatives, state Extension gin specialists, gin machinery manufacturers, and members of the American Cotton Manufacturers' Institute attended the meeting.

Ginners have invested heavily in new equipment designed to dry and clean seed cotton harvested by the rougher methods. The producer expects machine-harvested cotton to come out almost equal in grade, staple and turnout to that harvested by hand. At the same time, mills expect spinning quality of fibers to be unimpaired.

Bring these groups together, literally face to face, so they can better understand one another's problems. Encourage research on the problem by a federal agency, and help distribute the findings. That was the Council's function in that problem, and progress already is under way.

One way of protecting cotton's quality is to protect it against tar, grease, dirt, rain and other contaminants. With the present cotton package, it's difficult to provide adequate protection.

Would it be practical to develop a more protective, a more attractive bale wrapper? To help answer this question, a packaging subcommittee of the Council's Industrywide Cotton Quality Committee was formed during 1953.

A great deal of preliminary work already has been done on the packaging problem. For one thing, the Council has prepared a short history of American cotton packaging. The material has proved useful in providing background data for those collaborating on the project. Research has started on bale ties, too, as well as bale covering.

Other Activities

In outlining the Council's function in better production practices, it is well to point out that its founders wanted to make sure it stuck strictly to its job, and did not get drawn into controversies which could destroy it. They provided in its by-laws that the organization could take no position regarding any matter except when authorized by a two-thirds vote of the representatives of each branch of the industry, branches voting separately.

Those leaders were fully cognizant that political monkey business designed to catch votes today means nothing to cotton's position for tomorrow.

The future of cotton is dependent on reduced costs and improved quality.

This is accomplished only by finding answers through research and getting the research findings into practice on farms and other branches of the industry through top-flight educational and technical assistance. This will result in a better product at lower costs.

But the Council knows, too, that it is entirely possible for a man to build a better mousetrap and still starve to death. For this reason, the organization's departments of sales promotion and utilization research are operating at full speed to expand consumption possibilities and to let the buying public know about America's most versatile fiber and seed product.

Magazines, radio, newspapers and television give full attention to cotton. Advertising and editorial matter enthusiastically laud its versatility in both food and fashion.

A public relations program is creating a renewed confidence in the product within the cotton industry itself and is building goodwill for cotton in its dealings with the public and its customers.

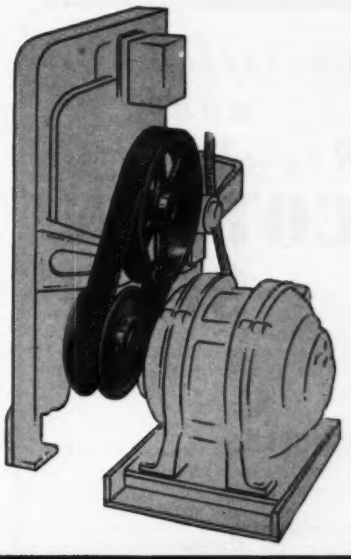
Evidence in the form of increased consumption of cotton and cottonseed in scores of uses emphasizes, more than words, effect of this great effort.

■ **JAMES A. McCONNELL, vice-president, Grange League Federation Exchange, Ithaca, N.Y., became administrator of Commodity Stabilization Services on Feb. 16, succeeding HOWARD H. GORDON, who resigned to return to Southern States Cooperative, Richmond, Va.**

it's new

it's exclusive

it's different



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Yes, here's a variable speed drive that will give years of trouble-free operation. Just look at these exclusive features:

WIDE SPEED RANGE — Up to 3 to 1 speed range ratio.

HORSEPOWER RANGE — Radically new notched belt construction gives higher horsepower capacity for single belt drive — 5 to 20 horsepower motors.

NEW CONSTRUCTION — The first wide range single groove stationary control variable pitch sheave with both flanges moving simultaneously.

POSITIVE LOCKING — Simplified design provides positive clamping of the two adjustable flanges eliminating fretting corrosion. Flanges are quickly and easily released for making speed changes.

HIGHER EFFICIENCY — Single wide belt gives maximum HP efficiency. Eliminates problem of maintaining matched belts and matched grooves for equal power distribution.

LESS SHAFT OVERHANG

ADJUSTABLE AT EITHER END — Single adjusting screw easily accessible at either end of the sheave.

NO LUBRICATION — No grease fittings or oil cups, therefore, no preventive maintenance needed.

MORE ECONOMICAL — This unit will give a variety of speed changes best suited for your product or operation . . . sensibly priced too.

For more detailed information call or write T. B. Wood's Sons Company . . . and ask for Bulletin #796.

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Cambridge, Mass. • Newark, N. J. • Dallas, Texas • Cleveland, Ohio

• March 2-3 — Midsouth Cotton Gin Operators' Schools for ginners of Arkansas, Louisiana, Mississippi, Missouri and Tennessee. To be held at locations in and near Memphis, Tenn.

• March 2-3—Oklahoma Cotton Ginners' Association annual meeting. Biltmore Hotel, Oklahoma City. J. D. Fleming, 1004 Cravens Building, Oklahoma City 2, secretary.

• March 7-8—Georgia Cotton Ginners' Association annual convention. Bon Air Hotel, Augusta. Tom Murray, P. O. Box 386, Sylvania, Ga., executive vice-president.

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Stoneville 2-B

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ALEXANDRIA SEED CO., INC.

P. O. Box 1946-G
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• March 9-10—Alabama-Florida Cotton Ginners' Association annual convention. Thomas Jefferson Hotel, Birmingham. Lawrence Ennis, Jr., Auburn, Ala., secretary.

• March 18-19-20—Third Annual Midsouth Gin Supply Exhibit. Midsouth Fairgrounds, Memphis. For information write W. Kemper Bruton, executive vice-president, Arkansas-Missouri Ginners' Association, P. O. Box 345, Blytheville, Ark. Arkansas-Missouri and Tennessee ginners' associations will hold annual conventions in connection with the exhibit.

• March 18-19-20 — Arkansas-Missouri Ginners' Association annual convention. Memphis. W. Kemper Bruton, P. O. Box 345, Blytheville, Ark., executive vice-president. To be held concurrently with Midsouth Gin Supply Exhibit.

• March 18-19-20 — Tennessee Cotton Ginners' Association annual convention. Memphis. W. T. Pigott, P. O. Box 226, Milan, Tenn., secretary-treasurer. To be held concurrently with Midsouth Gin Supply Exhibit.

• March 19-20-21—Seventh Annual West Coast Divisional Meeting, International Oil Mill Superintendents' Association. Paradise Inn, Phoenix, Ariz. H. F. Crossno, P. O. Box 15345, Vernon Branch, Los Angeles, meeting chairman.

• March 29-30—Valley Oilseed Processors' Association annual convention. Buena Vista Hotel, Biloxi, Miss. C. E. Garner, 1024 Exchange Building, Memphis, secretary.

• April 1-2—National Cotton Compress and Cotton Warehouse Association annual convention. Roosevelt Hotel, New Orleans. John H. Todd, 1085 Shrine Building, Memphis 3, executive vice-president.

• April 5-6-7—Texas Cotton Ginners' Association annual convention. State Fair Grounds, Dallas. Jay C. Stilley, 3720-24 Race Street, Dallas, executive vice-president. For exhibit space, write R. Haughton, president, Gin Machinery & Supply Association, Inc., 3116 Commerce Street (P. O. Box 444), Dallas 21.

• April 12-13-14—American Oil Chemists' Society spring meeting. Plaza Hotel, San Antonio, Texas. Mrs. Lucy R. Hawkins, 35 East Wacker Drive, Chicago, executive secretary.

• May 7-11—National Cottonseed Products Association annual convention. Shamrock Hotel, Houston. S. M. Harmon, 19 South Cleveland Street, Memphis, secretary-treasurer.

• May 24-25 — Oklahoma Cottonseed Crushers' Association annual meeting. Lake Murray Lodge, Ardmore. J. D. Fleming, 1004 Cravens Building, Oklahoma City 2, secretary.

• May 31-June 1—Alabama-Florida Cottonseed Products Association and Georgia Cottonseed Crushers' Association annual joint convention. General Oglethorpe Hotel, Wilmington Island, Savannah, Ga. T. R. Cain, 219 Church Street, Montgomery, executive secretary, Alabama-Florida association. J. E. Moses, 318 Grand Theatre Building, Atlanta 3, secretary-treasurer, Georgia association.

• June 2-3-4—Tri-States Oil Mill Superintendents' Association annual convention. Hotel Buena Vista, Biloxi, Miss. Roy Castillow, Southern Cotton Oil Co., Little Rock, Ark., secretary-treasurer.

• June 3-4-5—American Cotton Congress sponsored by Statewide Cotton Committee of Texas. Corpus Christi, Texas. For information write Burris C. Jackson, Hillsboro, Texas, general chairman.

• June 6-7-8-9—International Oil Mill Superintendents' Association annual convention. Plaza Hotel, San Antonio, Texas. H. E. Wilson, Peoples Cotton Oil Co., Wharton, Texas, secretary-treasurer.

• June 7-8—North Carolina Cottonseed Crushers' Association - South Carolina Cotton Seed Crushers' Association joint annual convention. Ocean Forest Hotel, Myrtle Beach, S.C. Mrs. M. U. Hogue, P. O. Box 747, Raleigh, N.C., secretary-treasurer, North Carolina association. Mrs. Durrett L. Williams, 609 Palmetto Building, Columbia, S.C., secretary-treasurer, South Carolina association.

• June 13-14-15 — Texas Cottonseed Crushers' Association sixtieth annual convention. Shamrock Hotel, Houston. Jack Whetstone, 624 Wilson Building, Dallas, secretary.

• June 30-July 1-2—Mississippi Cottonseed Crushers' Association forty-fifth annual convention. Hotel Buena Vista, Biloxi. J. A. Rogers, 207 One Hundred East Pearl Building, Jackson, secretary.

• July 6-7-8—Oil Mill Operators' Short Course. Texas A. & M. College, College Station. For information write Dr. J. D. Lindsay, head, department of chemical engineering, Texas A. & M. College, College Station.

• July 28-29-30—Eighth Annual Beltwide Cotton Mechanization Conference. Little Rock, Ark. For information write the National Cotton Council, P. O. Box 18, Memphis 1.

• Aug. 30-31-Sept. 1 — American Soybean Association thirty-fourth annual convention. Peabody Hotel, Memphis. Geo. M. Strayer, secretary-treasurer, Hudson, Iowa.

• Dec. 2-3—Eighth Annual Beltwide Insect Control Conference. Hotel Adolphus, Dallas. For information write National Cotton Council, P. O. Box 18, Memphis 1.

Theme of Texas Crushers' Convention Announced

Texas Cottonseed Crushers' Association members will have a real celebration at their annual convention June 13-14-15 at the Shamrock Hotel in Houston, Secretary Jack Whetstone, Dallas, reports. Theme of the convention will be A Three-Score-Mile Highway — Paved with Activities, marking the sixtieth anniversary of the Association.

Whetstone has advised members that they will be sent hotel reservation blanks after May 10, and that the hotel will not confirm reservations until the blanks have been sent. This is being done to avoid any confusion as to reservations for the Texas convention and the convention of the National Cottonseed Products Association, which will be held at the same location May 7-11.

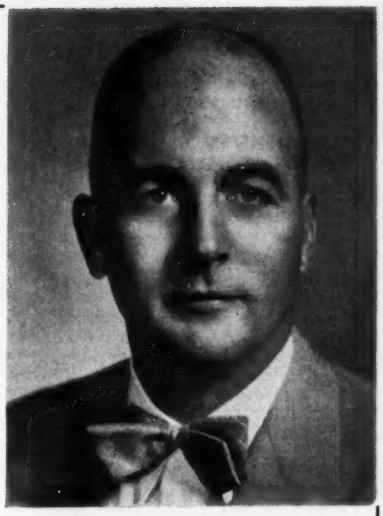
Ginner Is Candidate

M. R. Teinert, Doering & Teinert Gin, Walburg, Texas, a director of Texas Cotton Ginners' Association, is a candidate for the Texas House of Representatives from District 64. His friends throughout the ginning industry will wish him success in the race.

Ginners Can Help Mechanization

By HERBERT WILLIAMS

President, Georgia Cotton Ginners' Association



■ IN THE PAST few years the cotton farmer has made rapid strides toward complete mechanization. Surveys by the U.S. Department of Agriculture and State Agricultural Experiment Stations have indicated the technical feasibility of complete mechanization of cotton production and harvesting; however, these same surveys indicate limitation on the economic practicability of complete mechanization of cotton on our many smaller cotton farms in the Southeast.

It is my belief that our state ginner associations working through our individual ginners can accomplish much toward increasing cotton mechanization by making available to our cotton farmers the hard facts as to the technical and economic feasibility of mechanization. Each case should be weighed on its merits and recommendations made accordingly.

We have much educational work to do with our small cotton farmer in the Southeast. It may be years before these small farms are completely mechanized. We know that complete mechanization pays off for the larger cotton producer; however, let's not "oversell" our small farmers. Let's analyze the economic factors in their particular situations and then make our recommendations for complete or partial mechanization.

Cultural Practices

(Continued from Page 20)

65° F. Cottonseed germinate more rapidly and grow off faster when the soil temperature is 70° F. and above.

A well prepared soil that is firm, warm and moist is essential for good germination of cottonseed.

A runner-knife opener that cuts a narrow furrow for the seed is an excellent type of opener for planting either "on the bed" or "in the furrow." When planting on the bed, wings should be attached to each side of the knife opener to push aside large clods, sticks and root stubble. A small wheel with a hollow rubber tire set to run on the seed directly behind the furrow opener firms the soil and holds the moisture about the seed, aids germination, and increases stands under many conditions.

Where the soil is moist and sticky at planting time, a hollow, flexible center rubber covered presswheel can be used on the planter to firm and press the soil over the seed. If a crust forms, it can be broken up with a rotary hoe when the seedlings begin to emerge.

Thinning

Extensive experiments on the spacing, or thinning, of cotton plants covering a long period of years have clearly shown that the cotton plant is endowed with the ability to adjust itself to produce satisfactory yields within a comparatively wide range of spacing from 3 to 36-inch intervals along the row. As stated above, the trend among cotton farmers throughout the Cotton Belt is to plant sufficient seed to give a stand of 30 to 40 thousand plants per acre and *not* do any thinning. The seed may be drilled in a continuous stream along the row, or they may be dropped in hills. It is thought that, where grass and weeds come up thickly in the drill-row, hills of cotton are easier to hoe.

Some cotton growers argue that where cotton plants are thick, insects are hard to control and bolls are likely to rot because of the dense foliage. Insecticides properly applied will control cotton insects in either thin or thick spaced plants. Defoliation of the plants is better than thin spacing to let the hot sun dry out the low bolls.

It must be remembered that present day farming operations are far different than those practiced by our grandfathers and even our fathers.

Weed Control

If the average cotton grower did not have any grass or weeds to fight and get rid of, he would save at least $10 per acre in his annual hoe bill. Weeds in cotton fields are robbers. They rob the cotton grower of his profits by reducing yields; they rob him by lowering the quality of the cotton; they rob him by getting so thick during wet periods that the crop may have to be abandoned; they rob him by harboring insects that damage the crop; and they rob him by reducing the land value.

The question is often asked, "What can I do to control and kill the weeds in my cotton?" There are several methods, such as, (1) cultivation, (2) use of the rotary hoe, (3) use of flame cultivators, (4) pre-emergence application of chemicals, (5) post-emergence application of chemicals, and (6) preventing weeds from maturing seed. If weeds get by these methods, then the last resort is the hoe.

Cultivation is an operation that requires some kind of tool that will stir the surface soil to a shallow depth, in such a manner that weeds will be destroyed and crop growth promoted. The primary objective in cultivating cotton is to kill weeds. In cultivating to kill weeds the soil is stirred and aerated and put in a tilth condition to conserve and hold moisture and rainfall.

Cultivation

Cultivation should begin as soon as weeds appear and this is often before cotton seedlings emerge. A rotary hoe used at this stage will break the soil crust and kill young weeds. The rotary hoe can be used over the drill row and sweeps used to clean weeds from the

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All-Steel Self-Filling Non-Combustible

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middles. The tool can be used several times, if necessary, before cotton plants are 4 to 6 inches tall. The rotary hoe should be operated at speeds of 5 miles per hour or faster.

Wing sweeps should be set flat and run shallow when used close to cotton plants. The farmer should keep in mind he is cultivating to promote plant growth and yields. If roots are cut off by deep cultivation, the plants are retarded in growth and yields reduced.

The *pre-emergence* application of chemicals, such as the dinitro compounds, will prevent weed seeds from germinating for a period of 3 to 4 weeks. Pre-emergence chemicals are most effective when applied to soils that are slightly moist or where light rainfall occurs soon after planting and before emergence of the cotton seedlings. Directions of the manufacturer should be followed carefully when using pre-emergence chemicals.

Post-emergence herbicide chemicals consist of light oils—the non-fortified and the fortified types. The non-fortified oil depends on the presence of aromatic hydrocarbons for its weed killing properties, while the fortified oil kills weeds from a non-volatile herbicide and is more toxic to both weeds and cotton. Applications of herbicidal oils should begin when weed seedlings first appear in the area near the cotton, or 8 to 10 days after emergence of cotton seedlings. The applications can be repeated at 5-day intervals until the cotton begins to form a tough bark. Special spray shields or shoes and nozzles are required for the application of these oils. The oil should not be sprayed on the cotton leaves because the oil will kill cotton as well as weeds.

Instructions on the type of equipment, methods of calibrating the sprayer, and rates of application are available in booklets from the manufacturers of the oils and other agencies.

The use of *flame* for controlling weeds has been found satisfactory in some areas. The greatest disadvantage in the use of flame for killing weeds in cotton culture is that it cannot be used until the cotton plants are 6 to 8 weeks old and have begun to form a tough bark on the stems. If used when the cotton has young and tender stems, the flame will cause blisters on the stems. This kind of injury will stunt the growth of cotton plants. Special equipment and fuel are necessary for flame weed killing. High pressure tanks, safety controls and special burners are required.

Flame for killing weeds in cotton has proven more economical in the higher rainfall areas and in some irrigated areas than in the dry farming, low rainfall areas.

Prevention of weeds going to seed is a method of weed control that is greatly overlooked by farmers. In the spring and early summer the farmer fights weeds and grass with great ferocity, passion and exasperation. But along about July, he lays aside the hoe and other weed fighting equipment and says, "Boys, let's go fishing." While he's fishing, the weeds grow and in a month or two mature a seed crop. These seed are added to others produced during other years and the first thing the farmer knows, he has weeds coming up as thick as the hairs on a dog's back. If no weeds were allowed to go to seed, it is possible that eventually there would be no weeds to fight.

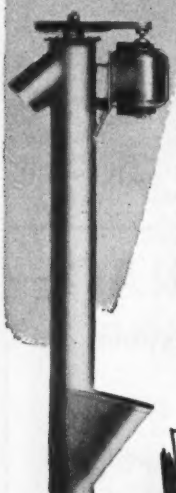
Cotton culture with no weeds would be a pleasure.

Want a Nice Year 'Round Profit...?

Install KELLY DUPLEX feed mill equipment

VERTICAL FEED MIXER
Available in 6 sizes
½ to 5 ton capacity—
to meet any need.

With grain becoming increasingly more important in the agricultural economy of the South, forward-looking cotton ginners have already adapted their operations to include Kelly Duplex grain handling and processing equipment. They've found that this equipment, designed and built for top efficiency, low maintenance and long life, is able to give them steady, year 'round business and employment ...greatly increased volume... and, above all, a GOOD profit. It can do the same for you!



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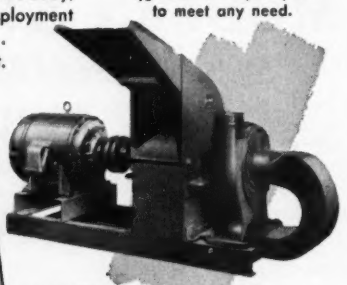

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☐ Model "M" Hammermill
☐ Model "S" Hammermill
☐ Electric Truck Hoist
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☐ Chain Drag
☐ Attrition Mill Blower
☐ Corn Crusher-Regulator
☐ Grain Feeder
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☐ Complete Line Catalog

Land-Use Emphasis Week Plans Made in Delta

Members of the Delta Council soil conservation committee met at Greenwood, Miss., Feb. 19 to make plans for the 1954 Land-Use Emphasis Week. Sam Thompson, Itta Bena, chairman of the committee, pointed out that the observance this year will be the third to be held in the Delta area.

Cotton Quality Statistics Are Summarized

Agricultural Marketing Service of USDA has published the bulletin Cotton Quality Statistics, United States, 1952-53. Copies may be obtained for 40 cents from the Superintendent of Documents, Washington 25. The publication contains detailed information as to the grade and staple of 1952-53 cotton by states and by districts.

■ **W. A. SUTTON has been appointed associate director of Georgia Extension Service, succeeding WALTER S. BROWN, who retires July 1; and R. S. WHEELER has been named associate director in charge of instruction at the University of Georgia college of agriculture, succeeding the late PAUL W. CHAPMAN.**

• Soybean Group Plans Margarine Drive

A CAMPAIGN for repeal of Minnesota and Wisconsin laws prohibiting the sale of yellow margarine is being organized by the American Soybean Association, Hudson, Iowa.

Minnesota and Wisconsin are the only two remaining states with statutory bans against the sale of colored margarine. Such prohibitory laws were repealed last year by Iowa, Montana, South Dakota and Vermont, bringing to 26 the number of states which took such action since 1944.

Plans announced by the soybean group are aimed at arousing both consumer and farmer support for repeal of the Minnesota and Wisconsin laws. The campaign would pit cash crop farmers, who grow soybeans and profit from magarine sales, against dairy farmers who have long had powerful representation in the Minnesota and Wisconsin legislatures, which do not convene again in regular session until next year.

The soybean group is launching its drive by emphasizing the increasing importance of the crop to Midwest farmers and pointing out that soybeans are now a major harvest, rivaling corn in cash value, in large sections of Minnesota and Wisconsin. A marked increase in soybean acreage has been predicted this coming summer to make up for anticipated decreased corn plantings.

While only two states have laws banning yellow margarine sales, laws imposing special taxes and various other types of restrictions on margarine usage and marketing remain in effect in a number of states and will again be a legislative issue on a broad scale next year, when the legislatures of 44 states convene in regular session. Proposals to repeal special state taxes on margarine failed of enactment last year in Iowa, North Dakota, South Dakota, Utah and Wisconsin.

In Massachusetts, one of the comparatively few states in which legislative sessions are being held this year, a bill to repeal state license fees for the sale of margarine is currently pending. The proposal is backed by the Massachusetts Retail Grocers' Association.

Statutory curbs on the use of margarine in state institutions also remain in effect in a number of states and will figure in future legislative controversy.

■ **W. D. WATKINS, assistant general manager, Western Cottonoil Co., has been elected a director of Citizens National Bank, Abilene.**

Oil Mill in India Installs Anderson Solvent Plant

A new continuous 21-ton solvent extraction plant has recently been placed in operation for the Tata Oil Mills, Bombay, India, by the V. D. Anderson Co., Cleveland. The plant is used to process Mowrah seedcakes into oil and meal. Mowrah oil is a traditional Indian product utilized primarily for soap.

Although primarily designed for processing Mowrah cake, the Anderson plant can handle any type of vegetable oil seedcake with the change-over being made within a few hours.

The new plant enables Tata to recover 1.8 to 2 tons more oil per day than produced by the former process. The plant incorporates the latest Anderson advances in chemical engineering for the oil milling field. It is an outdoor-type plant which was designed with special features that make for satisfactory operation in tropical climates. Automatic and continuous in operation, the plant is operated by one man per shift.

The plant was supplied by Volkart Brothers, Anderson's representatives in India. Erection of the plant was completed under the supervision of George Briggs, export field engineer of the V. D. Anderson Co.

General Sales Meeting of Briggs-Weaver Machinery Co. Held Jan. 25-26-27

BRIGGS-WEAVER Machinery Co. salesmen from Dallas, Houston and Fort Worth met with company officials at the home office in Dallas Jan. 25-26-27 for a general sales meeting. Front row (seated), l. to r.: Darrell Manley, L. C. Scott, Dick Ivers, Ken McCain, Ed Pflanz, C. C. Crockett. Second row: Tom Reed, Newt Rudy, A. C. Beale, C. E. Waddill, Jerry Little, Milt Goodrich, J. R. Adam, Ray Scaff, Bob Dickmeyer. Third row: C. W. Weir, R. B. Wolfe, Walter Koller, Jack Russell, Horace Allen, Walter Mahanay, Joseph Willson. Fourth row: Wilbur Smith, J. R. Clark, Jack Helm, Jess Peurifoy, George Abele, Eddie Nicklow. Fifth row: Doug Cowart, W. A. Lee, Tommy Wyrick, Ed Castle, Lloyd Whittington, Glenn Hudson. Sixth row: Claud Norton, M. E. Robertson, G. F. Higgs, Jim Dale, Toad Fowler, George Thorn. Seventh row: Blake Crouch, B. T. White, Bruce Robertson, J. C. Keeney, Ken McDaniels, W. R. Taylor, J. T. Evans, Ashley DeWitt, L. E. Rice, Perry Howell, Carl Kinnan, Wink Jordan, Ken Erickson, Al Hahnl.

In Birmingham, March 9-10

Alabama and Florida Ginners To Meet

■ PANEL DISCUSSION planned on over-processing cotton. Gin machinery manufacturers and USDA to participate.

The program for the annual convention of the Alabama-Florida Cotton Ginners' Association is almost completed, according to Lawrence Ennis, Jr., Auburn, secretary. The meeting will be held March 9-10 at Thomas Jefferson Hotel, Birmingham.

Over-processing of Cotton and Ways To Improve Quality by Better Ginning is the title of a panel discussion which has been arranged for the meeting. J. C. Oglesbee, Extension cotton ginning specialist, Atlanta, will be moderator. Panel members include C. A. Bennett, in charge, regional cotton ginning investigations, USDA, Stoneville, Miss.; E. H. Brooks, vice-president, Continental Gin Co., Birmingham; Harold Lummus, vice-president, Lummus Cotton Gin Co., Columbus, Ga.; E. R. Smith, Southeastern representative of John E. Mitchell Co., Columbia, S.C.; H. M. Davis, field representative, The Murray Co. of Texas, Memphis, and Bob Bernhardt of Centennial Gin Co.

Foy Helms, Alabama Extension Service economist, will discuss agricultural prospects for Alabama in 1954. Claude Welch, Memphis, director of the National Cotton Council's production and marketing division, has been invited to appear at the meeting, and Secretary Ennis is scheduled to discuss group insurance plans. Alabama's Maid of Cotton and alternate to the 1954 national Maid, Hope White, will address the group briefly.

Ennis has announced that a humorous program is being planned for the annual banquet, which will be held the night of March 9.

Association officers, in addition to Ennis, are Joe Fleming, Huntsville, president; J. A. Thompson, Troy, vice-president; and Joe Bob Elliott, Athens, treasurer.

Cotton Planting Active In Texas Lower Valley

Pre-irrigation of cotton land in the Lower Rio Grande Valley is about completed and cotton planting is actively under way, the Texas weekly crop and weather bulletin reports. Blowing sand has injured some young plants that are just coming up and may cause some replanting.

Flax in South Texas escaped serious winter injury and has made fair to good progress, but the crop is suffering from lack of moisture as plants near the critical stage of growth.

Moisture is inadequate over much of the state and has been sapped by recent strong winds and dust storms. Most ranges are providing little grazing in the western portion of the state and supplemental feeding of livestock continues heavy.

Larrison Leaves USDA for General Electric Post

John E. Larrison, who has headed up the laboratory equipment work at the USDA fiber laboratory at Stoneville, Miss., since July 1946, resigned Feb. 18 to accept a position as design engineer, General Electric Co. at Syracuse, N.Y. Specifically, Larrison will be charged with the design of automatic machinery for the manufacture of electronic equipment which in the past has been made by hand.

During World War II, Larrison was employed as an engineer by the Navy, and was stationed at the Mare Island Naval Ship Yards at Vallejo, Calif., where he assisted in the design of naval vessels.

Under Larrison's supervision, his unit at Stoneville was responsible for a number of new technical developments in the field of cotton and cottonseed testing and marketing. The work of his unit in developing an automatic sampling and packaging unit for use in gins has attracted industry-wide attention. Larrison received the coveted USDA superior accomplishment award for this work in March 1951.

Many new items of laboratory testing equipment have been designed and constructed by Larrison and his unit in coperation with staff members and other projects at Stoneville. These include an improved fractionator for determining the foreign matter content of seed cotton and a device for blending samples of lint cotton for fiber testing. In the field of cottonseed grading, Larrison designed and constructed, in cooperation with cottonseed chemists and physicists, equipment for use in grading cottonseed, which includes a mechanical cottonseed cleaner, a revolutionary vacuum fuming oven for rapid cottonseed linters determination, and experimental electronic equipment for the determination of cottonseed moisture and oil content.

Larrison's father, C. E. Larrison of Wilmot, Ark., is a prominent cotton ginner and banker, and a past president of the Arkansas-Missouri Ginners' Association.

New Grain Inspection Fees Announced by USDA

The Agricultural Marketing Service, USDA, has announced a new schedule of grain inspection fees of interest to oil mills and others handling soybeans. The new schedule, applicable in cases of appeal or disputes and effective June 1, 1954, is as follows:

Bulk or sacked grain in carload lots, $5 per car.

Bulk or sacked grain in trucks or trailers, $3 per truck or trailer lot.

Bulk or sacked grain in boats, barges, or other vessels, $1.50 per thousand bushels or fraction thereof, with a minimum of $3 per lot.

Submitted samples or packages of grain, $2 per sample or package.

All other lots of grain, $1.50 per thousand bushels or fraction thereof, with a minimum of $3 per lot.

Additional charges may be made for telegrams, express, parcel post, registry fees, travel expenses and other items incurred by the Department on account of an appeal or dispute. The purpose of the new schedule is to bring fees and charges into line with increased costs.

• Machine Gins As It Harvests Cotton

AN EXPERIMENTAL MACHINE, designed to gin cotton as it is stripped mechanically in the field, is being demonstrated in Childress County, Texas, by Francis M. Wagnon and A. C. Imhof. Wagnon, who lives at Borger, is the inventor and Imhof built the stripper-gin in his machine shop at Childress.

After stripping the cotton, the machine conveys it to a gin stand which separates the lint and seed. The seed is deposited in a 45-bushel seed bin, and the lint is packaged in bales of 125 pounds, which later are expected to be increased in size to bales of 300 pounds.

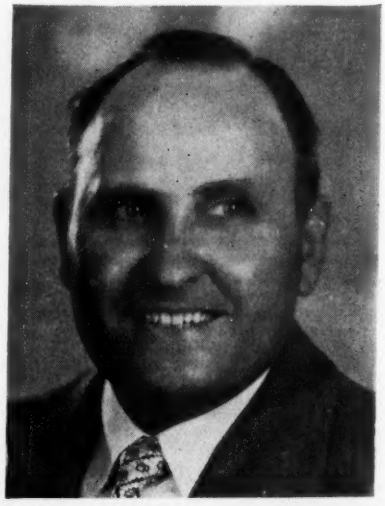
The present machine was built from homemade parts and is mounted on an old combine chassis, but the owners expect to make an improved model that will be mounted on a crawler type tractor.

The machine was demonstrated Feb. 23 before about 600 persons at Childress, and the local chamber of commerce is investigating the possibility of arranging local manufacturing facilities. No further demonstrations are planned this season, but the equipment will be displayed March 9 at the Childress Farm Implement Show.

Presenting

Maurice Goodwin

Afton, Texas



MAURICE GOODWIN, Afton, Texas, was born in San Augustine County in 1914. Now the owner of two gins, he entered the ginning business in 1937 when he became bookkeeper and cotton buyer with his uncle, J. A. Goodwin, in East Afton. He later purchased the East Afton plant and a gin at Flomot in Motley County.

Goodwin is a director of the First State Bank, Matador. He has served as a director of Texas Cotton Ginners' Association and as vice-president of the Afton school board. The ginner has three children, one boy and two girls, who have sung on programs arranged for ginners' meetings. Goodwin lists himself as an ardent quail hunter.

• World Lint Crop May Set Record

FREE WORLD COTTON production this season will almost certainly set a postwar record, even though production outside the U.S. is expected to decline about half a million bales, says the February monthly review issue by the International Cotton Advisory Committee, Washington.

Present indications are for a free world production of 29.4 million bales, half a million bales more than last season's crop of 28.8 million bales. Added to the stocks of 15.4 million bales at the beginning of this season, this indicates total supplies of about 45 million bales, as compared with 42.1 million for 1952-53.

Cotton consumption, says the review, has been running ahead of last season in many countries; and, unless there is a reversal of present trends in the main consuming centers, 1953-54 consumption will exceed last season's total of 25.9 million bales. Consumption may even approach the record total in 1950-51 of 26.5 million bales. As compared to 1952-53, largest rate of increase in consumption has been in Japan (28 percent), the United Kingdom (25 percent), and Germany (18 percent).

On the basis of probable higher level of cotton consumption in Western Europe and Japan, and relatively low stocks in many importing countries, the review concludes that there is likely to be some increase in cotton exports this season. U.S. cotton prices and credit policies will be influential in determining the extent of exports from this country, altthough it appears likely that there will be some rise in U.S. exports unless relative prices prevent.

Dairymen Urged To Solve Own Market Problems

Dairymen were told that they must solve their own marketing problems by speakers at the recent Dairy Short Course at New Mexico A. & M. College. Sam E. Von Rosenberg, manager of the American Dairy Association of Texas, said, "We can no longer depend on government aid and support programs. It's up to us to sell our products."

New Mexico ADA members voted to support the national program to provide funds for research and promotional activities, making 24 states, out of the 25 necessary for adoption of the plan, that have approved it. (Editor's Note: The program to increase consumption of dairy products was discussed in a staff article in The Cotton Gin and Oil Mill Press of Feb. 13.)

Small Decrease in Total Livestock and Poultry

U.S. farms on Jan. 1, 1954, had more cattle and poultry than a year earlier but fewer hogs, sheep, horses and mules, USDA's annual inventory shows. Net decrease for all livestock and poultry was one percent, the first decline since 1949.

Inventories of cattle and calves showed only one percent increase, a gain of about one million head, compared with gains of about six million head, each, in 1951 and 1952. Commercial slaughter of 35 million cattle and calves in 1953 was a record high and 32 percent larger than in 1952.

Market for 15,000 Bales Of Cotton in Ethiopia

Ethiopia will import 12,000 to 15,000 bales of cotton during the 1953-54 season, USDA estimates, and about 15,000 to 20,000 bales yearly during the next few years. U.S. should be the principal supplier unless prices of American cotton are too far above world prices.

Mill interests in Ethiopia hope to develop domestic cotton production on about 60,000 acres to supply the country's needs, but it is expected that 10 to 15 years will be required to reach this goal. Ginning facilities will be needed if cotton production expands, as the only gin in the country is one used to gin long staple cotton for export.

Ethiopia now produces about 3,000 bales of short staple and 3,500 bales of long staple cotton annually.

A cotton spinning and weaving mill at Diredawa produces around five million pounds of yarn annually, and a mill being built at Addis Ababa is expected to start operations in June. This mill is expected to produce less than 500,000 pounds of yarn during its first year.

Mother of Dixon White Buried at Brownwood

The many friends of Dixon White, Lubbock Cotton Oil Co., Lubbock, will join the staff of The Cotton Gin and Oil Mill Press in extending sympathy to him on the loss of his mother, who was buried at Brownwood, Texas, on Feb. 19.

At Southern Laboratory

Oilseed Processors Attend Clinic

■ LINTERS QUALITY problem takes limelight. Substantial further improvement needed, group decides in New Orleans.

Approximately 80 oil mill managers, superintendents, technical personnel and staff members of the Southern Regional Research Laboratory attended the third annual Cottonseed Processing Clinic held at the Laboratory in New Orleans Feb. 15-16.

The second day of the Clinic, which is sponsored jointly by the Laboratory and the Valley Oilseed Processors' Association, was devoted to improving the quality of linters.

The consensus of those present was that progress is being made in improving the quality of linters. The group also expressed the view that substantial further improvement is needed and that the Laboratory should play an important part in bringing about such improvement through an expansion of its investigations on the cleaning of cottonseed.

John F. Moloney, Memphis, National Cottonseed Products Association, discussed the economic value of linters to oil mills and farmers on Feb. 15. He estimated that linters accounted for 13 percent of the value of cottonseed in the 10-year period 1942-51.

Moloney also pointed out that the cost of producing linters exceeds mill income from that commodity. "It is estimated that the removal of linters accounts for about 60 percent of the power cost, 25 percent of labor cost and about 20-25 percent of the total cost of mill operation," Moloney stated.

M. C. Verdery, Anderson, Clayton & Co., Houston, discussed developments in seed cleaning and lint cleaning in West Texas. Tests and experiments with new equipment were described. Verdery said, "During the past several months we have made a much more careful investigation of sampling in connection with seed cleaning tests and find that by careful supervision, accurate and reasonably consistent results may be obtained."

Desirable characteristics of linters for various purposes were described on the second day of the conference by Marion E. Mann, Atlanta, Williamson, Northup Co., Inc. Mann described good qualities for linters used in the chemical industry for the manufacture of acetate, rayon, plastics, explosives, films, paper, etc. In 1951-52 these uses accounted for 60 percent of the crop. Desirable characteristics for main non-chemical uses, including bedding, automobile batts and pads, furniture upholstery, battery boxes, pharmaceutical supplies and linoleum, were also outlined by Mann.

J. W. Bremer, Swift & Co., Chicago, described a proposed physico-chemical method of determining the quality of second cut linters. Representative samples of linters which have been exposed to heat and volatilized hydrochloric acid are brushed through a U.S. No. 50 mesh screen which catches any foreign matter. Bremer discussed results of a questionnaire which was sent to a group which attended last year's Clinic. Most of those who returned the questionnaire favored using this method, Bremer said.

Charles C. Speakes, agricultural engineer at USDA's Cotton Ginning Laboratory, Stoneville, Miss., discussed new seed cotton cleaning equipment and its effect on the quality of cottonseed. He pointed out that much laboratory research is directed toward alleviating the problem presented by rough harvesting practices. He described the stick and stem remover which is now under test and modification at the Stoneville and Chickasha, Okla., laboratories.

Speakes declared that "although much remains to be accomplished, the modern gin is capable of producing cleaner cottonseed from trashy cotton than its counterpart of a decade or more ago."

Other papers presented Feb. 16 include the following:

Charles R. Campbell, Dallas, engineering contractor, use of basket-type seed cleaners; Allen Smith, Perkins Oil Co., Memphis, jet-type lint cleaners and use of pneumatic cleaners; R. D. Long, Carver Cotton Gin Co., Memphis, operating standards for seed cleaning and lint room machinery; B. B. Annis, Ward Voss and Associates, Memphis, desirable characteristics in linters for paper manufacture.

Statements were made by J. H. Brawner, Southern Cotton Oil Co., New Orleans, chairman of the subcommittee on cottonseed cleaning, and F. M. Wells, Buckeye Cotton Oil Co., Cincinnati, chairman of the lint cleaning subcommittee.

Ralph Woodruff, Osceola Products Co., Osceola, Ark., president of the Valley Association, presided on Feb. 16.

On Feb. 15 J. A. Kime of the Laboratory presided. Division heads and other members of the Laboratory staff described current status of cottonseed research. These included C. H. Fisher, chief of USDA's Southern Utilization Research Branch; A. M. Altschul, head of the oilseed division; F. H. Thurber, oilseed division; J. M. Dechary, oilseed division; H. L. E. Vix, engineering and development division; E. A. Gastrock, head of the engineering division; and L. L. Holzenthal.

Cecil Wamble, manager, Cottonseed Products Research Laboratory, College Station, Texas, presented a summary report on a three-year study of screw-press processing of cottonseed.

Officers of the Valley Association, in addition to Woodruff, are I. H. Fleming, Jr., DeSoto Oil Co., Memphis, vice-president, and C. E. Garner, Memphis, secretary.

• Georgia Mill Is Host To Soybean Meet

ABOUT 65 farmers and businessmen attended a recent soybean meeting called by Taylor Oil & Peanut Mills, Moultrie, Ga., according to P. E. Watts. Watts pointed out that soybean acreage will be increased in the area this year and said that the purpose of the meeting was to help farmers learn more about soybean production and harvesting.

H. G. Ray, Georgia Peanut Co., Moultrie, presided at the meeting. Warren H. Marchant, Coastal Plain Experiment Station, Tifton, made recommendations for growing beans this year. J. E. Moses, secretary-treasurer, Georgia Cottonseed Crushers' Association, Atlanta, attended and addressed the group.

The meeting concluded with the showing of a film, Soybeans—The Feature Story.

■ R. F. BETHEA, former manager of Swift & Co. oil mill at Albany, Ga., in enjoying his retirement at Sarasota, Fla.

Photo by Ed Hollowell, NCPA Fieldman.

Alabama Community Receives Award

WINNING COMMUNITIES in Alabama's cotton improvement contest received awards this month. State winner for 1953 was the Atmore One-Variety Cotton Improvement Association, Escambia County. District champions included Central in Lauderdale County, Five Points in Chambers, Moore's Valley in Marengo, and Harpersville in Shelby. Shown here at the Five Points award meeting are (l. to r.) T. R. Cain, Montgomery, secretary of the Alabama-Florida Cottonseed Products Association; D. M. Wilhelm, Montgomery, secretary of the Alabama Cotton Manufacturers' Association; Roy Grady, representing Five Points growers; and O. N. Andrews, Auburn, Extension cotton specialist. The contest is co-sponsored by the Associations and is conducted by the Extension Service. State winner received $2,000 and district winners $500 each.

A TYPE of sprayer that can be used, as can a knapsack sprayer, in controlling Johnson grass in cotton fields with herbicidal oils. The method, developed by Texas Experiment Station, is described in the accompanying article.

At Texas Experiment Station

Johnson Grass Control Method Is Developed

■ PATCHES of grass found in many fields can be eradicated by using herbicidal oil in knapsack sprayer or other simple equipment. New method compares favorably with hoeing and does little damage to growing cotton plants when properly used.

By A. B. KENNERLY

EVEN the best cotton growers are plagued at times by the persistent growth of Johnson grass in spots over the field. It is troublesome, and there is also the risk that grass will spread over the farm. As one owner of a string of rented farms put it, "I got so I could see a spot of Johnson grass a half-mile away." Recent research by the Texas Agricultural Experiment Station reveals that these spots can now be successfully eradicated.

The method found to give best results without damaging cotton plants is to apply herbicidal oil to the crowns and the first few inches of the stems of established Johnson grass which kills the grass at the ground line. Pay-off comes in comparison with hoeing when treatment is repeated at 10- or 15-day intervals as needed to control re-growth. This finally eradicates root-stock infestations of the grass in a single season. Hand hoeing usually does no more than temporarily delay growth of the grass.

The only equipment needed is a knapsack sprayer which can be carried on the operator's back. "It is light and easy to carry if it is not overloaded with oil," says H. E. Rea, reporting on the work done by the Station. "The spray tank has a capacity of three gallons, but in spot oiling Johnson grass in rows, the operator seldom needs more than a gallon of oil with him at any one time. A gallon is enough to oil the established Johnson grass in the rows of ¼ to ½ of an acre of cotton. Adding a small quantity of oil to the spray tank every few rounds from a reserve supply at the end of the rows is much more efficient than for the operator to fill his sprayer to capacity."

Stems of Johnson grass can be "cut" with oil applied from such a hand sprayer faster than they can be cut with a hoe. Herbicidal oils used in spot treating Johnson grass are volatile and have little or no residual effect on the soil.

"Two rows can be taken at a time in spot oiling Johnson grass in cotton except when the cotton is over hip-high," says Rea. Attempts made to treat four rows at a time left too much of the Johnson grass not treated when the operator was obliged to watch four rows.

Cotton will not survive that receives an application of spot oiling, but accidental spraying of only an occasional cotton plant should not interfere with successful control of spots of Johnson grass. "If the operator is alert," Rea explains on this point, "he can treat the Johnson grass without treating any cotton plants that are two inches or more away from a Johnson grass stem at the ground line. After he has gained some experience, the operator may use his foot to push aside cotton plants where they are very close to a Johnson grass stem."

The treated stems of Johnson grass are usually dead the day after treatment or at least show they are going to die, and a second trip through the field may be needed the third day to treat grass missed the first time. After that the field need not be spot-treated again until three or four inches of regrowth has been made from root-stocks of the treated Johnson grass. This usually means an infested field must be spot treated every 10 to 15 days during the growing season, or about four or five times a season.

"Eradication of root stock infestations of Johnson grass in the cotton rows is the reward for close attention to spot treatment throughout the season," Rea points out. "In experimental trials in the Brazos River Valley near College Station, the per-acre cost for labor and oil for a season has not greatly exceeded the cost of cutting Johnson grass with a hoe. The flexibility of a hand sprayer and the freedom of the operator to travel at varying speeds along the rows are needed to successfully spot treat established Johnson grass in the cotton rows. Experimental attempts to provide these requirements in tractor operated sprayers have been less successful than the use of hand equipment."

Do Not Overplant, Farmers Warned

Cotton farmers have been reminded by USDA that anyone who knowingly overplants his cotton acreage allotment in 1954 will not be eligible for cost sharing in carrying out soil and water conservation practices under this year's agricultural conservation program. Cotton is the only crop to which this regulation applies.

• Nepometer Featured At Cotton Clinic

ABOUT 200 persons attended the fifth annual Cotton Research Clinic held this year at Pinehurst, N.C., Feb. 17-18-19. A feature of the meeting was a new instrument, the nepometer, which has been designed to determine the nep potential of cotton.

The nepometer, said J. F. Bogdan, North Carolina State College, Raleigh, should enable mills to select cotton best suited for the particular type of goods to be produced.

The cotton breeder will be able to use the nepometer profitably, also, since he will be able to select varieties with a low nep potential for breeding work.

Thomas Kerr of USDA's field crop research branch, Beltsville, Md., told the group that a new method for testing strength of cotton fibers will aid in breeding cotton for added strength without losing other desirable qualities now in cotton varieties.

Burt Johnson, National Cotton Council, Memphis, emphasized that efficient cotton production depends on a strong chain of operations, each dependent on the other.

The Clinic is sponsored by the Council, and general chairman was M. Earl Heard, West Point Manufacturing Co., West Point, Ga.

■ T. ROY REID, USDA personnel director, succeeds DR. P. V. CARDON as head of the USDA graduate school. Doctor Cardon has been named director-general of the United Nations' Food and Agriculture Organization.

Classified Advertising

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FOR SALE—72-85" cookers, rolls, formers, cake presses and parts, accumulators-pumps, hull-packers, Bauer No. 153 separating units, bar and disc hullers, beaters-shakers, Carver linters, single box baling presses, filter presses, expellers, attrition mills, pellet machines, pneumatic seed unloader. If it's used in oil mill, we have it.—V. A. Lessor and Co., P. O. Box No. 108, Fort Worth, Texas.

OIL MILL EQUIPMENT FOR SALE—Complete solvent plants, rebuilt twin motor Anderson high speed expellers, French screw presses, stack cookers, meal coolers, filter presses, oil screening tanks, complete modern prepressing or single press expeller mills.—Pittock and Associates, Glen Riddle, Pa.

FOR SALE — Cookers—rolls—expellers—141 and 176-saw completely rebuilt Carver linters—fans—36" Chandler and Carver hullers—26" motor driven attrition mill—filter presses—Gruendler Jr. hammer mill—No. 8 cake breaker—screw conveyor.—Sproles & Cook Machinery Co., Inc., 1212 S. Industrial, Dallas, Texas. Telephone PRospect 5958.

FOR SALE—One, two and four pass lint beaters, sample seed shaker, all steel Continental single box linter press, Carver Tru-Line gummer, Bauer No. 153 separating unit, 42" Chandler huller, French 72" stack cooker, 75 h.p. Marine type boiler, Bauer 199 seed cleaner, lint room and flue system, other items.—Address Dept. "96" c/o Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas, Texas.

FOR SALE—Complete hydraulic oil mill less buildings. Mill equipped with power, three presses, cookers, cake stripper, cutter and rolls. Cake mill, separating unit, beaters, protein machine, 10 linters, Martin lint handling equipment, Helm saw filer, press box, seed house equipment and oil tanks, all or part.—Contact Union Cotton Oil Co., Prague, Okla.

FOR SALE—Six 1949 model French screw presses, 4-section frame with heavy-duty all water cooled insert type cages, full auxiliary drainage cage with water cooled bottom half, 50 h.p. 220-440 volt, 1800 r.p.m. motors. Cooker-driers are 5-high, 72-inch diameter, 15 h.p. motors, latest type HD Frenco enclosed overhead drives, with ball or roller bearings. Run only 615 days on soybeans. Approximate parts cost to convert to cottonseed $1,250. Also, 36-plate, 36" x 36" Sperry filter press, center feed, side discharge, $1,450.—Gibson Trading Company, c/o H. S. George, Jonestown, Miss.

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FOR SALE— At half of original cost: Machinery from collapsed building, used only 3 weeks. Consisting of 9" and 12" conveyor with steel trough, pneumatic seed unloader. Sutorbilt blowing system, electric motors with switches, reduction gears, steel elevator with 9" buckets, Grinnell sprinkler control system. Special—Waukesha gas engine, 100 h.p. with 75 k.w. generator, $1,250.—Kenedy Cotton Oil Mill, Kenedy, Texas.

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Gin Equipment for Sale

FOR SALE—The best buys offered in cotton gins, either to move or operate where now located.—Contact M. M. Phillips, P. O. Box 1288, Telephone 5-8555, Corpus Christi, Texas.

FOR SALE—Complete gin stands: Two 80 saw Contintentals, bargain.—A. L. Luyat, P. O. Box 178, 22nd St. Sta., St. Petersburg 3, Fla.

FOR SALE—4-80 Continental F3 gins. 4-80 Lummus gins. 4-90 Gullett gins. 6-70 Murray glass front gins with lint flue and with V-belt Standard Mitchells. 4-80 Continental lint cleaners and flues. 5-60 inch Super Mitchells. One flue cylinder 50 inch incline steel cleaner. 1—6 cylinder 50 inch incline steel cleaner, 2-50 inch 4 cylinder incline steel cleaners. 1-12 and 1-16 section Lummus thermo cleaners. 1-20 shelf Hardwicke-Etter dryer complete. 1 Continental 2 trough dryer complete. 1 Murray big reel drier. 1 EJ tramper. 1 Lummus tramper. 5-80 Hardwicke-Etter large size huller feeders. All sizes condensers and pumps and many other items.—Bill Smith, phones 4-9626 and 4-7847, Box 694, Abilene, Texas.

COMPLETE GIN FOR SALE—Will sell to highest bidder, further information write C. N. Mougey, Star Route, Sardis, Miss.

FOR SALE—2 Continental 45 fans, 1 cast iron, 1 flat back both in good condition. 1 Hardwicke-Etter 40 fan, cast iron in good condition. 1 Continental 12" elevator.—Farmers Co-op Society of Acuff, Route 1, Lubbock, Texas.

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FOR SALE—Very reasonable cotton gin in good condition in Robstown, Texas.—Write or see Fred Nemec, Route 4, Robstown, Texas.

FOR SALE in Abilene Warehouse: Complete 1948 model Hardwicke-Etter outfit reconditioned and in excellent condition. Consisting of gins, feeders, conveyors, distributor, 14 foot bur machine, 5 and 7 cylinder cleaners, steel platform, press, tramper, condenser, submerged lint flue drier, seed scales, rotary lift transmission and power if wanted. Also, (not in Abilene) almost complete 4-80 all steel outfit consisting of gins, feeders, conveyor, distributor, press, tramper, condenser and separator.—Bill Smith, phones 4-9626 and 4-7847, Box 694, Abilene, Texas.

FOR SALE—Used loose press, new Denkie tie press, Webb 80 Hi-Dee compress, with boiler.—Address Dept. "77", c/o Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas, Texas.

FOR SALE—Four stand 80 saw Cen-Tennial Super Chief gin. All new equipment in 1948. Two 80 h.p. natural gas engines, less than 5,000 bales ginned at plant. 22 foot scales, good buy.—For information write Whittenburg Gin Company, Box 189, McAllen, Texas.

BARGAIN PRICED FOR QUICK SALE—One 4-80 complete gin. Hardwicke-Etter gin stands, three cleaners, Mitchell Standard feeders, hydraulic press pump and tramper practically new. One LeRoi "8" engine, practically new. Two International 32 h.p. engines. All engines have cooling towers. Will sell as complete unit or separate items. Not sufficient cotton raised to operate.—Contact Toller Bros., 222 South 10th St., Fort Smith, Ark.

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FOR SALE—One model 18 Murray Big Reel dryer with burner, in good running order, $750.—J. L. Smallwood, Phone 72 or 320, Levelland, Texas.

FOR SALE—Price reasonable, Continental Paragon double box press, E. J. Tramper, 4 Pratt A. B. huller front gins with special C feeders, section of lint flue and connections to 4 gins. Would trade some of this for Continental 4-80 conveyor distributor. — Aycock Gins, Carrollton, Georgia.

FOR SALE—4-80 saw Continental gin stands, 45 inch Claret suction fan, Murray press pump, steel bound gin press, 3 inch line shaft and various sizes belt distributor for 5-80 saw gin stands, steel and wood pulleys of various sizes, 6 and 9 inch seed conveyors.—See Theo Rogge, Shiner, Texas.

FOR SALE—Five-80 Continental model C—DC—V-belt drive brush gins, new metal brush cylinders and bearings, with Model 30 fronts. 5-80 Continental Double X huller cleaner feeders. Model C lint flue system on 7'-8" centers. Steel 5-gin belt distributor, all in good condition. Price, $3000. —Farmers Cooperative Gin Co., Carnegie, Okla.

FOR SALE—Four 80-saw Murray gin. 80 h.p. F-M engine, metal clad building. Priced to sell.—R. M. Foster, Hico, La.

FOR SALE—One Continental upright hydraulic press pump. Three F.E.C. Mitchells, ball-bearing, flat belt. Three I.S.&B. Continental stands.—R. I. West, Checotah, Okla.

FOR SALE—Bur Machines: 1—14 foot all steel late model Lummus, 2—10 foot all steel Continentals, 1—10 foot all steel Murray, 1—10 foot wood frame Hardwicke-Etter, 1—14 foot wood frame Hardwicke-Etter, tower driers 18 and 24 shelf government type. Trampers: Lummus, Murray, Cameron and Continental E.J.; 1 standard size dust collector. Gin stands, most any make; fans, all sizes; pumps. We invite you to visit our warehouses and lot. Buying and selling good late model gin machinery.—Spencer & Son's Cotton Gin Sales & Service, 5 miles north on Highway 81, Georgetown, Texas.

FOR SALE—5-80 Murray gin plant with Super Mitchells, less power. Good condition. No longer need account reduced acreage.—W. L. Gladish, Box 300, Lawrenceburg, Tennessee.

Equipment Wanted

WANTED—36" motor driven attrition mill, 440 volt, 56, 60 or 75 h.p. Give description and price. —Hazlehurst Oil Mill & Fertilizer Co., Hazlehurst, Miss.

WANTED—All steel up packing press in good condition, preferably Lummus.—Write Celeste Co-op. Gin Association, Celeste, Texas.

WANTED—All-steel up-packing press. Must be priced right.—Eckhardt Gin Co., Yorktown, Texas.

WANTED—Used 14 foot steel bur machine, Murray or Hardwicke-Etter, good condition.—Write P. O. Box 150, Charleston, Mo.

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WANTED—Competent gin manager for irrigated territory.—Write Box "HO" c/o Cotton Gin and Oil Mill Press, P. O. Box 444, Dallas, Texas.

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FOR THE LARGEST STOCK of good, clean used gas or diesel engines in Texas, always see Stewart & Stevenson Services first. Contact your nearest branch.

FOR SALE—New and rebuilt Minneapolis-Moline engines, from 35 h.p. to 220 h.p., call us day or night for parts and service.—Fort Worth Machinery Co., 918 E. Berry St., Fort Worth, Texas.

FOR SALE—Fairbanks-Morse full diesel engines, 120 to 360 h.p.; also parts for YV Fairbanks-Morse diesel engines.—A. C. Askew, Box 3073, Whittier Station, Tulsa 8, Okla. Phone 6-6120.

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FOR SALE—One 350 h.p., 277 r.p.m Bruce MacBeth gas engine, clutch and drive pulley. Price, $6,000.—Arcadia Cotton Oil Co., Arcadia, La.

FOR SALE—1946 model QT-20 Hyster 2,000-lb. lift truck, good condition. Can be seen loading linters. Cost $3,000, price $975.—Delta Oil Mill, Inc., Jonestown, Miss.

• Scientists Fooled By Plant Roots

A GROWTH modifier named MOPA (short for alpha-methoxyphenylacetic acid) has been fooling scientists at USDA. MOPA can move from one plant to another through adjacent roots. Physiologists have thought this was impossible.

It is hoped that the characteristics of MOPA can be built into useful herbicides, fungicides and nematocides.

MOPA reacts to plants by forming a gall on the stem and moving upward to produce a secondary gall at the plant tip. The chemical can also move downward, out of the root, and into an adjacent root.

It can go from one kind of plant to another through the roots, but experiments show that MOPA does not move from plant to plant through the air.

Oklahoma Land Contest Dates Are Announced

The third annual national land judging contest and land appreciation school will be held in Oklahoma City on April 29-30, 1954, according to the contest committee.

Cash awards totaling $1,800 will be paid winning 4-H and FFA teams and individuals. For the first time, $400 will be paid to top teams in each of the four regions of the country.

The contest is sponsored by the Oklahoma Publishing Co., and any county or parish in states outside Oklahoma may enter one FFA and one 4-H team.

There will be a separate judging division for adults, with women competing in a separate class. Plaques and trophies go to adult winners.

Further contest information may be had by writing Edd Roberts, Stillwater, Okla., or Sandy Saunders, Radio Station WKY, Okahoma City.

• Anhydrous Ammonia Shortage Likely

A SHORTAGE of anhydrous ammonia is expected in 1954 by E. W. Thomas of Booneville, Mo., new president of the Agricultural Ammonia Institute, in spite of a USDA forecast of 20 percent greater supplies. Thomas said a survey indicates that 40 percent of the nation's agricultural nitrogen supply this year will be in liquid form.

AAI executive committee members met recently in Memphis to plan 1954 activities, including the annual convention Dec. 5-8 at New Orleans. Officers include Hampton Pugh, Pugh Gin and Fertilizer Co., Tillar, Ark., secretary; General Ralph H. Wooten, Midsouth Chemical Co., Memphis, treasurer; and Jack F. Criswell, Memphis, executive vice-president.

1954 Flow of Rio Grande To Be Far Below Normal

The 1954 water supply outlook for the Rio Grande in Colorado and New Mexico indicates below normal stream flow, a federal-state survey shows. Snow to Feb. 1 was about 80 percent of normal at higher elevations and much less at lower elevations. The probable summer flow of the Rio Grande is less than 75 percent of normal in New Mexico.

Irrigated Pastures Pay New Mexico Farmers

Permanent pasture irrigation pays dividends, says Gordon Hoff, New Mexico Extension Service agronomist. "To get the highest production with the smallest amount of water, plan pasture irrigation before seeding; consider the texture of soil, length of run and size of the head of water to be used. Fit irrigations in with the fertilizer rotation system to keep the plants growing rapidly and the turf in good shape," he explains.

Hoff points out that the best irrigation system is one that makes it possible to keep a good supply of moisture in the two or three feet of soil at the surface. Excess water leaches nutrients and drains below the root zone where it is not available for forage production.

The number of irrigations depends on weather and soil texture. In warm weather, irrigations are usually needed every two weeks. Light-textured and shallow soils may need water each 7 to 10 days. Hoff states that pastures should be irrigated once or twice during the winter.

"If the water supply is adequate and moderate in cost, irrigated pastures can compete favorably with other crops grown in New Mexico," Hoff declares.

100 Million Pines Planted

The 100 millionth pine seedling in America's largest privately owned man-made forest was planted Feb. 18 at Millard, Miss. The forest is owned by Gaylord Container Corp. It covers 100,000 acres. A ceremony was scheduled to celebrate the 100-millionth mile mark.

...*"This year I'm planting LESS acreage but I'll make MORE money with SINKERS PERFECT COTTONSEED!"*

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This advertisement will appear in leading Southern newspapers during March, and in color in the April issue of THE PROGRESSIVE FARMER

• Dairy Supports Are Lowered

DAIRY PRODUCT prices will be supported at 75 percent of parity beginning April 1, according to a decision made by USDA.

The Department said that the reduction from 90 percent of parity supports for prices of milk for manufacture and butterfat was made after discussion with farm leaders, dairy organizations, and others.

The USDA announcement continued, "When the price support level of 90 percent on milk and butterfat was announced a year ago, CCC inventory of butter, cheese and non-fat dry milk solids was equivalent to approximately 1.44 billion pounds of whole milk, or about 1.2 percent of the milk production during the 1952-53 marketing year. CCC stocks of dairy products were relatively low.

"Production of milk and butterfat had been about equal to demand during the previous four years when prices of milk and butterfat had been supported. The outlook for milk production for the 1953-54 marketing year was uncertain. Best current estimates indicate that production during the 1953-54 marketing year will reach about 122 billion pounds, an increase of about five billion pounds over the 1952-53 year.

"CCC stocks now on hand represent the equivalent of more than eight billion pounds of whole milk, compared with 1.44 billion pounds a year ago. This eight billion pounds is over six percent of the year's production. Since production of dairy products during the past year has been more than adequate and the outlook for this year's production is good, Secretary Benson has set the support level at 75 percent of parity. He states: 'The immediate problems of the dairy industry should be attacked through increased consumption of dairy products.' "

Cotton Allotment Increase Criticized by Dearing

Cotton acreage allotment increases recently approved by Congress are unwarranted when considered in the light of the surplus supply situation, said Gerald L. Dearing, cotton columnist for the Memphis Commercial Appeal, in a speech before the Memphis Agricultural Club Feb. 15.

Dearing said that the larger acreage only postponed the day of tight, restricted acreage and that next year—unless there is an unexpected and unprecedented pickup in consumption—greatly reduced allotments will have to be put into effect.

Fusarium Wilt Expert To Study in England

William C. Snyder, University of California plant pathologist and Fusarium wilt authority, has gone to England for a six-month sabbatical leave. While in Britain, Snyder will study at the Kew Gardens near London. His trip is being financed by the Rockefeller Foundation, and it is hoped that the study will result in better and more uniform methods of identifying members of the Fusarium family.

Fewer Live Pink Bollworms Found in Texas Areas

Pink bollworm inspections of standing stalks in eastern and central Texas at the end of January showed only 67 percent of pink bollworms alive this year, as compared with 91 percent at the same time in 1953.

USDA also reports that surface debris in South Texas and adjacent areas of Mexico is estimated to be only 10 percent of that present in the past three years. In this material inspected through Jan. 31, 81 percent of the pink bollworms have been found alive compared with 88 percent at the same time last year

• Packers Protesting Cuban Lard Policy

THE MEAT packing industry announced Feb. 17 renewal of a formal, vigorous protest to the American government against Cuban authorization of a previously cancelled concession which would lead to establishment of a duty-free and tax-free monopoly to compete in Cuba with American fats and lard. A statement by the American Meat Institute, representing the industry, said:

"Lard, for which Cuba is the leading export market, was the principal item on which Cuba made concessions in the original Cuban-U.S. trade agreement; receiving in return a concession from the U.S. regarding the duties on Cuban sugar that might be imported into this country. Any tampering with the traditional manner in which the trade agreement in good faith has been carried out actually is nullification in fact, if not in law, in the trade agreement as it applies to lard.

"Now a new minister of the treasury has reinstated an order authorizing this monopoly, which was previously rescinded by the government of President Batista, in the Cuban Official Gazette of Dec. 2, 1952. This followed our original protest against establishment of the monopoly which came about through a Cuban law granting concessions for companies establishing a 'new industry,' which did not exist prior to Aug. 14, 1945. In the original protest it was pointed out that the company seeking to establish the monopoly actually was not a 'new industry,' because other companies in Cuba prior to 1945 had been engaged in either refining or hydrogenating lard or other fats.

"It had not been expected that Cuba would renew this activity which conceivably might result in pressures which could curtail the Cuban sugar market in the U.S., in favor of other sugar producing areas. Inasmuch as hogs are raised on millions of American farms, the Cuban market for American lard is as important to American hog producers as the American market is to Cuban sugar interests and Cuban labor. Further, monopoly always results in extortionate prices for consumers, and at the same time the economic welfare of Cuba and Cuban labor undoubtedly would be adversely affected should the sugar quota for the U.S. be sharply reduced.

• The Chinese grew cotton as a decorative plant as early as 700 A.D.

CG&OMPress Photo.

Cotton in February at Research Station in Oklahoma

AN INTERESTING feature of the Oklahoma Ginners' Field Day held Feb. 16 at Chickasha was a visit to the new greenhouse at the Oklahoma Cotton Research Station. The greenhouse was given to the Station by the Oklahoma Cotton Research Foundation, headed by Marion Lucas of Chickasha. Shown examining some of the more than 700 cotton plants in the greenhouse are, left to right, John M. Green, agronomist with the Oklahoma Agricultural Experiment Station, and E. S. Oswalt, Station superintendent.

Make Cotton Pay More in '54

Proper Water Use for Increased Yields

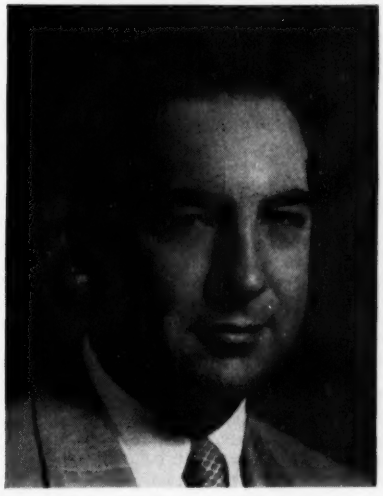
"Probably the greatest single factor influencing production of cotton is that of available soil moisture."

By OMER J. KELLEY

PROBABLY the greatest single factor influencing production of cotton is that of available soil moisture. Cotton in the U.S. is grown over a wide range of soil moisture and climatic conditions. These can be divided roughly into three regions according to their moisture conditions and practices. In the humid region, including the cotton-growing states of Arkansas, Mississippi, Alabama, and Georgia, rainfall conditions permit successful cotton production most years. However, because of frequent summer drouths, supplemental irrigation pays big dividends in most years, and in some years makes the difference between a good yield and a crop failure. In the dryland areas of Texas and Oklahoma there is not sufficient moisture for maximum cotton production. Supplemental irrigation is possible on only a portion of the acreage, but good yields of cotton can generally be obtained if moisture conservation practices are followed. In the irrigated sections of the West, including parts of Texas, Arizona, New Mexico, and California, production of cotton depends primarily on water from irrigation.

TOP—Non-irrigated cotton, Auburn, Ala., Aug. 8, 1952. Yield, 1149 pounds per acre. BOTTOM—Irrigated cotton, Auburn, Ala., Aug. 8, 1952. Yield, 2538 pounds per acre.

OMER J. KELLEY is Head, Western Section of Soil and Water Management, Soil and Water Conservation Research Branch, Agricultural Research Service, USDA, Washington.



Supplemental Irrigation

Experimental work in Mississippi, Georgia, Arkansas, and Missouri has shown that supplemental irrigation will increase cotton yields in certain years. One of the questions facing the cotton grower who contemplates irrigation is this: How frequently will I benefit from supplemental irrigation, and how much? Gattis in the Cotton Trade Journal of October 1953 gave data which give some insight on the frequency that benefits may be expected. During a 20-year period from 1927 to 1946 there had been some 35 to 44 drouths occurring during the growing season in Arkansas. In other words, during this time there were between 35 and 44 periods at which cotton growth would be reduced and yields lowered as a result of lack of sufficient moisture. At these times supplemental irrigation would pay big dividends.

In making an over-all summary of the benefits of irrigation for Arkansas, Gattis in The Cotton Gin and Oil Mill Press in July of 1953 reported that one could expect, on the 10- to 20-year average basis, that cotton yields from irrigation would be increased from 25 to 35 percent.

John Carreker conducted supplemental irrigation experiments on cotton at Athens, Ga., during the five-year period from 1949 to 1953. He averaged nearly four irrigations per year, with a yearly addition of around seven inches of water per acre, and an increase in yield of 58 percent.

D. M. Whitt reported an experiment in Missouri in 1953. He obtained 1,414 pounds of seed cotton per acre for unirrigated cotton, and 3,458 pounds per acre with 7.4 inches of supplemental irrigation water. He found the cotton reacted to conditions of moisture stress by shedding leaves, flowers, squares and bolls. The irrigated cotton produced 60 percent heavier bolls at the first picking than unirrigated cotton. The irrigated cotton had longer staple length and

lower percentage of lint than the unirrigated cotton.

In addition to this average increase by supplemental irrigation, one eliminates entirely the hazard of a crop failure due to drouths. Gattis goes on to show that even with a conservative estimate of a 25 percent yield increase due to supplemental irrigation, the average net return per acre per year (this is in excess of all costs) was around $20.

Major problems which confront the supplemental irrigator are: when he should irrigate, how much water per irrigation and at what rate, and possibly the number of irrigations which are required. There is always the possibility that one may get rain "this afternoon or tomorrow" and, if so, irrigation would not be required. Another question is just how dry should one allow the soil to get before he irrigates. One needs to know the extent of the root zone before he can decide where to determine the soil moisture. Gattis points out that in his studies in Arkansas the root zone for cotton is only around 12 inches. He recommends irrigation when this layer of soil is reduced to approximately 50 percent of the available moisture-holding capacity. If one has supplemental irrigation equipment, he should plan to irrigate whenever the crop needs to be irrigated and should not wait for a rain "tomorrow" or the "next day." Only by using the irrigation equipment adequately and keeping the cotton plants supplied with available moisture can one expect to realize the monetary return indicated above. However, there is a real soil erosion hazard from "unexpected rains" coming soon after an irrigation. Probably this hazard can best be reduced through contouring and following established practices for erosion control.

There are areas in the High Plains of Texas where the length of the growing season is the limiting factor in cotton production where supplemental irrigation water is available. In these areas it is frequently desirable to use only one or two irrigations on cotton and to allow the cotton plant to suffer for moisture late during the season. Additional irrigation under these conditions may result only in vegetative growth and a delay in maturity.

Moisture Conservation on Dry Land

On large acreages used for cotton production in certain parts of Texas and Oklahoma it is not possible to use supplemental irrigation, and rainfall most years is not adequate for maximum production. In these and similar areas it is of major importance to conserve the moisture that does fall in order to make it available for plant growth.

Fisher and Burnett in a recent Texas Experiment Station Bulletin No. 767 summarized the effects of conservation and utilization of soil moisture on cotton production. They found that contouring and terracing to prevent runoff and erosion significantly increased the amount of available moisture in the soil and the yield of cotton. They found also that the use of flood waters, crop residues, and tillage offers additional means of increasing the amount of water that was stored for plant use. They gave data taken over a period of 22 years, from 1930 to 1952, showing the relationship between available soil moisture at planting time and the yield of lint cotton. The accompanying chart, (Figure 1), is taken from their bulletin.

This chart shows very clearly the relationship between available stored moisture at seeding time and cotton yield. With one-half inch of available moisture in the second- and third-foot of soil, the average yield per acre was 57 pounds of lint cotton. When there was one inch of available moisture in the soil, the yield increased to 89 pounds of lint cotton per acre. As the amount of available moisture at planting increased to two, three, and four inches, the yields were, respectively, 187, 330, and 518 pounds of lint cotton per acre. Each additional amount of water greatly increased the yield of cotton, especially where the available moisture was above the minimum amount required for normal growth. It is recognized that if ample amounts of well-distributed rainfall should occur throughout the growing season, the amount of moisture in the soil at planting time would have little or no influence on yields.

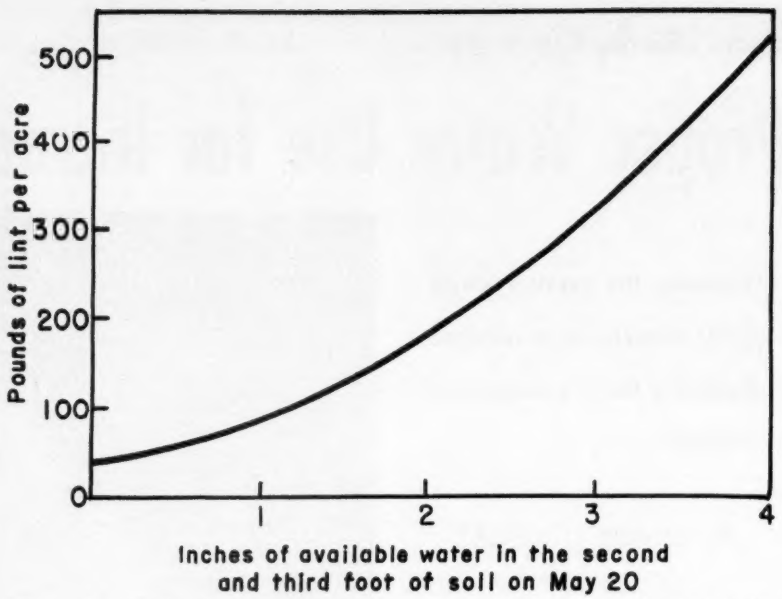


Figure 1. Relation between available soil moisture at planting time and yield of lint cotton, 1930-52, Spur, Texas.

However, at the Spur Experiment Station and in a large number of areas in Texas and Oklahoma, there is not ample rainfall. It is, therefore, highly important in such areas to use moisture conservation practices and to conserve all moisture possible for plant growth. Spur Station data showed that the practice of contouring reduced runoff from 2.75 inches for straight row farming on land with a 0.5 percent slope, to 1.95 inches, and increased yield of cotton by 29 pounds per acre. They stated that the increased annual growth returns for contour farming over straight row farming averaged $7.14 per acre. Since little or no additional labor was necessary to farm on a contour, the increased return was considered to be practically a clear profit. They found the use of closed level terraces in conjunction with contouring prevented further runoff and increased the yield of cotton another 71 pounds per acre over straight row farming. This yield increase was related directly to an increase in stored soil moisture. They found that the value of this practice was $16.82 per acre in addition to the control of runoff and erosion. On the average they found that reducing the runoff by one acre inch increased the acre yield of lint 26 pounds with a value of $5.51. They valued one acre foot of water saved, on the average, around $66.12.

The exact relationship to be found for any given farmer will depend upon his soil characteristics, which include the moisture-holding capacity and the climate conditions under which he is farming. He should, however, make a constant effort to understand his soil and the moisture characteristics in relation to climate and crop production. Every effort should be made to conserve what moisture is available and to prevent erosion and runoff. It should be pointed out that moisture is only one of the factors that affect plant production. While most of the soils in this rainfall area are relatively fertile and fertilizer responses are not frequent or large, especially on the heavy soils, spacing of plants is important. At Big Spring, Texas, very little difference in lint yield was obtained by plant spacings varying from 12 to 24 inches in 44-inch rows. Closer spacings in the row and wider rows tended to reduce yields. It is important to use special weed control measures, preparations for the control of insects, and other practices that might benefit the crop where there is sufficient moisture for production of high yields.

Cotton Production Under Irrigation

In much of the cotton-producing area of the Southwest (New Mexico, Arizona, California, and portions of Texas), the crop is dependent almost entirely upon irrigation water for growth. In these areas it is important to know when to irrigate, how dry the soil should be before irrigation, and the relationship of moisture level to fertility requirements, as well as spacing of plants and other factors which affect the over-all production of the crop.

Numerous experiments have been conducted in this area in the past which have related cotton production to given moisture treatments. Other experiments have been conducted in relating nitrogen or phosphorus fertilization to cotton pro-

Table 1. The effect of soil moisture levels upon the yield and quality of cotton grown on a Holtville silty clay—stratified phase. Brawley, Calif., 1952.

Soil Moisture [1] Treatment	Bales Acre	Seed Index	Break Index	Length U.H.M.	Dead Seed
Wet—⅔ atmosphere [2]	3.64	11.6	9.76	1.05	6.6
Dry—6 atmosphere	2.62	10.5	9.78	1.02	6.0
Very Dry—15 atmosphere	1.80	9.5	9.52	0.96	17.7
Wet-Dry—Wet until early bolls open, then dry	3.24	11.4	9.71	1.05	9.3
Wet-Very Dry—Dry until early bolls open, then wet	3.04	11.3	9.65	1.05	9.0

[1] All plots were kept wet until fruiting stage (July 1). Differential irrigations were started at this time.
[2] The 8"-16" depth was allowed to reach the indicated stress before irrigation.

duction. There have, however, been relatively few experiments in which a variation of factors, such as moisture, nitrogen, and plant spacing have been combined into one experiment to try to determine the optimum combination of these various factors for cotton production. Hamilton and Stanberry at Yuma, Ariz., conducted such an experiment in 1952. The results of their experiment are shown in Figure 2.

It was noted in this experiment that moisture had little or no effect at the 60-pound nitrogen level. There also was a slight effect, if any, at the 150-pound nitrogen level. However, when nitrogen was increased to 375 pounds per acre, there was a marked effect on each of the moisture treatments. One readily gathers from this experiment that there was an effect of nitrogen at each of the moisture levels. The important data, however, in this experiment are obtained when one compares the dry treatment at the low nitrogen level with the wet treatment at the high nitrogen level. This comparison shows the importance of getting the optimum combination of factors together for cotton production. It should be pointed out that this experiment was conducted on the very sandy soils of the Yuma Mesa of Arizona where nitrogen and water requirements are unusually high.

Other cotton irrigation experiments were conducted in California by Adams, et al, 1926 to 1935, and by Harris and Hawkins in Arizona in 1942 and 1947. Harris and Hawkins pointed out that withholding moisture during the fruiting period tended to decrease vegetative growth and stimulate fruiting. They found no difference in yield between plots which received ample moisture throughout the season and those in which the soil moisture in the surface foot of soil was allowed to reach the permanent wilting point. Krantz and Stockinger of Brawley, Calif., used this information as a guide in setting up Treatments 2 and 3 in the 1952 experiment (see Table 1). Acala 4-42 cotton was planted on April 17 and uniform irrigations were applied to all treatments on May 24 and June 15. The irrigation differentials given in Table 1 were started during the fruiting period (July 1 or about three weeks after flowering started). Adequate fertilization and insect control were provided.

Soil moisture treatments had a marked effect on cotton yields with the highest yield occurring in the wet plot where the soil moisture tension had been maintained below two-thirds atmospheres throughout the growing season. The lowest yield was obtained in the very dry plot which had adequate moisture up until fruiting period and then was irrigated when the soil moisture content in the most active root zone approached the permanent wilting point.

Lint quality determinations made on

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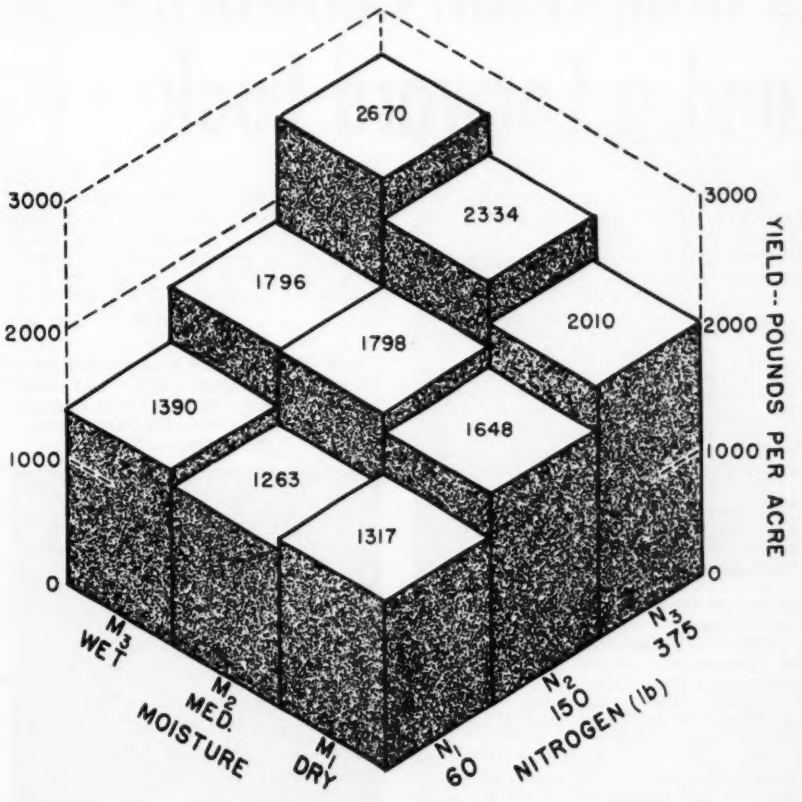


Wet - Irrigated where the root zone tension reached 200cm of water
Medium - Irrigated where the root zone tension reached 600cm of water
Dry - Irrigated where the root zone tension reached wilting percentage

Figure 2. The effect of moisture and nitrogen on the yield of seed cotton, Yuma, Ariz., 1952.

Make Cotton Pay More in '54

CG&OMPress Photo.

INSECTICIDE being applied by low-pressure, low-gallonage ground machine.

"Current insect control methods are not perfect, but tremendous progress has been made since insects were first recorded as pests of cotton."

By K. P. EWING

Cotton Insects and Their Control— A Backward and a Forward Look

A CENTURY AGO when a farmer planted cotton he knew that, if an insect outbreak occurred, it might destroy his entire crop—it might even destroy all the cotton in the area. There were no insecticides or other remedies that he could rely upon to give adequate protection against these outbreaks. However, at that time most cotton farmers had only a limited amount of capital invested; so a crop failure did not usually mean financial ruin.

Today a high proportion of the cotton is produced by farmers with large capital investment. The farm plant has to keep operating and earning a certain amount of money or the farmer will go bankrupt. To stay in business he must continually make a crop. He cannot afford failure, even for a single year. This means he must use efficient farming methods, which include insect control when needed.

Current insect-control methods are not perfect, but tremendous progress has been made since insects were first recorded as pests of cotton. Let us take a hurried glance back over some of the milestones in our road of progress.

1793—Recognition of severe insect losses to cotton.

1855—Damage to cotton caused by insects noted in the First Report of the United States Entomological Commission.

1878—First direct appropriation by Congress for cotton-insect research.

1892—The boll weevil crossed the Rio Grande into the United States near Brownsville, Texas.

1902—Establishment of the first boll weevil research laboratory at Victoria, Texas.

1903—Birth of the Extension Service in a cotton field near Terrell, Texas, because of the boll weevil.

1916—Discovery of the value of calcium arsenate for boll weevil control.

1917—First pink bollworm found in the United States near Hearne, Texas.

1922—First practical use of aircraft for insect control at Tallulah, La.

1922—Boll weevil completed its eastward and northward spread to the eastern seaboard.

1930-31—Discovery and demonstration that arsenicals killed sucking insects and that combinations of arsenicals and sulfur gave economical control of certain species.

1945-46—Discovery of the value of organic insecticides for the control of cotton insects.

1948-50—Demonstration of the value of early-season control of insects on a community-wide basis.

1950-51—Widespread use of low-pressure, low-gallonage sprays for control of cotton insects.

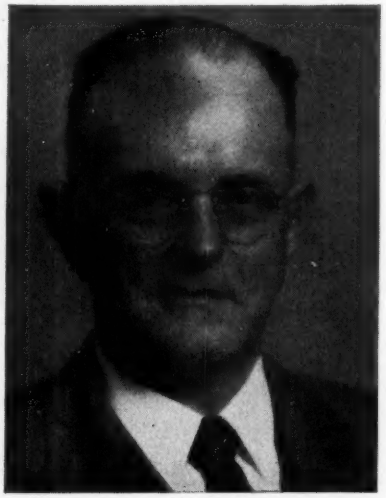
1954 (Jan. 24)—Dedication of an up-to-date laboratory at Brownsville, Texas, to serve as headquarters for a coordinated federal-state-industry sponsored research program on the pink bollworm.

This backward glance points out some of the progress that has been made in research on cotton-insect control. As of the present, however, we know that our problems are not solved. We must look to the future for continued progress.

The look into the immediate future is not all bright. One of the dark spots in the picture is the matter of insect resistance to the new organic insecticides. House flies and mosquitoes have developed resistance to DDT and other

(Continued on Page 73)

K. P. EWING is In Charge, Section of Insects Affecting Cotton and Other Fiber Plants, Entomology Research Branch, Agricultural Research Service, USDA, Washington.



Make Cotton Pay More in '54

"Insect control must be considered as a definite part of the production program if maximum efficiency in production is to be obtained."

ADVANTAGES of earlier fruiting and earlier maturing varieties of cotton may be lost when thrips are allowed to interfere with normal growth and development. Plant at left, above, shows serious thrips damage; healthy plant at right received early-season control.

Fitting Insect Control Into Modern Cotton Production

By H. G. JOHNSTON

H. G. JOHNSTON is Head, Research and Development, Production and Marketing Division, National Cotton Council, Memphis.

HISTORICALLY, cotton production in the South has required an abundance of comparatively cheap labor. The traditionally high labor requirements and low production per man hour inevitably lead to high production costs and low net income for cotton farmers. As a result, many farm workers have been attracted to urban areas by higher wages during the last 15 years. With fewer workers available, competition for their services has caused wage rates to increase, and a tendency toward still higher production costs developed.

This situation has stimulated a conspicuous increase in the efficiency of cotton production. This is clearly indicated by increased yields per acre with fewer man hours of labor and a lower cost of production than would otherwise be the case. Fundamentally this increased efficiency has been due to the rapid mechanization of cotton production during recent years. However, the transition from mule to machine has required a greatly increased investment per farm unit. To be successful economically this change has demanded more efficient farm management to insure maximum production, reduced costs and greater net income.

For many years cotton insect pests have been considered an important factor in determining the maximum per-acre yield. The crop reduction caused by insects from year to year and place to place is extremely variable and may range from very little loss to almost complete destruction. With the greater investment required for mechanical cotton production, the grower must protect that investment by controlling insect pests. Although the greatest return from an effective insect control program will undoubtedly be reflected in increased yields per acre, there are other important factors in a modern cotton production program that are also affected by insect damage.

Cotton breeders have been striving for many years to develop earlier fruiting and earlier maturing varieties of cotton. Such varieties have many advantages, including more effective and more economical control of insects during late season. Cotton growers lose many, if not all, of these advantages, however, when an uncontrolled thrips infestation in the seedling stage may delay fruiting and maturity for two or three weeks. Thrips attack the foliage and terminal buds of seedling plants, preventing normal growth and causing abnormal development of the plant. The leaves become curled and, in severe cases, the terminal bud may be destroyed and many seedling plants may be killed. The direct damage to the seedling and the resulting slow growth make the plant more susceptible to diseases. During the periods of cool, unfavorable growing weather this damage may become severe with the stand reduced considerably, even to the extent that replanting may be necessary. In some areas, though, where favorable growing conditions usually prevail, infested plants may recover rapidly and the damage be much less severe.

Thrips infestation is usually not uniform throughout the field and individual plants within a heavily infested area are not uniformly damaged. Consequently, even though damaged plants eventually recover and may produce as much cotton as a normal plant, there is a complete lack of uniformity in growth, plant type, fruiting and maturity. This lack of uniformity is now recognized as an important factor in the efficiency of chemical defoliation and mechanical harvesting.

If defoliation is to be most effective and the greatest benefits derived from picker efficiency, every possible aid must be given to improving all factors affecting defoliation. Efficient defoliation is dependent upon several factors, some of which may be directly affected by the effective control of insects or the lack of proper control. Mature plants defoliate best and most completely and for best results the boll-load should be heavy and vegetative development almost stopped, but not completely. Consequently, it is important that every effort be made to get and maintain an even stand of cotton in order to promote uniform plant growth and boll maturity.

Because of the extreme variation in

the extent of damage to individual plants, uneven stands often result from heavy thrips infestation, and maturity of seriously damaged plants may be delayed for two weeks or more. Consequently, when normal or uninjured plants reach maturity and are ready for most effective defoliation, damaged plants are in various stages of maturity. Under such conditions there is no time when all plants will react most favorably to the application of a defoliant. The immature plants will not defoliate properly, and yield, fiber and seed quality may be reduced due to an excessive number of immature bolls. Under some conditions, poor defoliation may seriously affect the efficiency of mechanical harvesting.

Uniform growth, plant type and boll maturity are also important factors affecting the efficiency of mechanical harvesting. These factors may be affected by uncontrolled infestations of other insects as well as thrips. An uneven stand resulting from thrips or other causes leaves many plants with excessively wide spacing which leads to the development of large plants with wide, spreading branches. Such plants do not lend themselves to efficient mechanical harvesting. A heavy thrips infestation causes the complete destruction of the terminal bud in many seedling plants. If these plants survive, as many do, development is delayed and a multiple-branched plant results. Instead of one upright, central stem, which is normal for a cotton plant, two, three or more secondary branches develop, resulting in a spreading plant that is not conducive to efficient mechanical harvesting.

An ideal plant development for most efficient mechanical harvesting is a comparatively short, upright plant with short, well developed lateral branches and a mature boll on every fruiting node. Even under optimum growing conditions such development is not possible if damaging infestations of fleahoppers, boll weevils or bollworms are allowed to develop. When an excessive number of squares or bolls are destroyed, the plant produces a rapid vegetative growth, resulting in abnormally large plants. If such insect infestations are not immediately controlled, a large part of the normal fruiting area of the plant is bare at harvest time.

Fortunately the cotton plant has a remarkable ability to compensate for such losses if growing conditions are favorable later in the season. Under favorable conditions potential losses in yield may be regained at an increased cost for insect control to protect the late-maturing crop over a prolonged growing season. However, the advantages that might have been gained through more efficient mechanical harvesting by preventing such losses, and the increased cost of insecticides cannot be regained. The uniformity of fruiting, plant type and maturity is completely lost. Under such conditions two pickings are required when only one might have been possible if insects had been controlled at the proper time, and uniform fruiting maintained.

Under favorable conditions the population of such pests as boll weevils, bollworms, pink bollworms, aphids and spider mites build up rapidly during the growing season. As the cotton plant grows larger, conditions are more favorable for the development of these pests and effective control is more difficult. As a result, an increased dosage of insecticides is required and the interval between applications must often be reduced. Consequently, an increased number of applications are required to protect the crop to maturity. This increased cost for cotton insect control is often the result of poor management in not obtaining adequate control at the proper time earlier in the season.

It is generally recognized that tremendous progress has been made during recent years in developing more effective control of cotton-insect pests. Although the development in many new and more effective chemicals has been largely responsible for this progress, the fact that the cotton grower has swapped his mule for a tractor has played an important part in this development. Mechanical farming has made possible the development of equipment for applying insecticides more thoroughly and more effectively than before. The speed with which production practices, including insect control, can be accomplished with modern equipment makes possible more thorough application of insecticides at the proper time. This is still one of the most important factors in effectively and economically controlling insect pests. There are also other practices that have developed as an essential part of mechanical cotton production that can be used to good advantage for insect control if properly managed.

It has been known for many years that an early harvest and the early destruction of cotton stalks are highly effective in reducing the number of boll weevils that survive the winter to attack the crop the following year. The pink bollworm, now a major threat to the entire Cotton Belt, is even more vulnerable to this practice. The rapid development of mechanization, with the development of defoliation for mechanical harvesting, has greatly enhanced the possibility of utilizing this practice for the partial control of at least two of our major cotton pests. The complete destruction of cotton stalks is also an important factor in seedbed preparation, weed control, and mechanical harvesting of next year's crop. Thus this practice may be utilized for a dual purpose if properly managed.

For all practical purposes the boll weevil is restricted to the cotton plant for a food supply. It is a tropical insect and, even under favorable conditions, only a comparatively small percentage survives the winter. The elimination of growing cotton plants as early as possible in the fall has a two-fold effect upon the boll weevil. The only source of food for adult weevils is eliminated and the tremendous population increase that usually occurs during this period is prevented. In general those weevils that reach the adult stage late in the season are most successful in surviving the winter. If the food supply could be eliminated 30 days before frost, many of the adult weevils would starve and those that went into hibernation would be in poor condition for winter survival. The number of weevils emerging the following spring would be comparatively small.

Complete defoliation that prevents regrowth will also deprive adult weevils of a food supply and greatly reduce further population increase. Since crop residue in the field is of minor importance in the winter survival of boll weevils, complete destruction of the cotton plant is not essential in accomplishing these results.

The pink bollworm is also restricted to cotton for its principal food supply. Consequently, complete defoliation that prevents regrowth has the same effect as for the boll weevil in preventing a tremendous increase in the number of pink bollworms late in the season. However, the pink bollworm spends the winter primarily in the crop residue in the field, in trash carried to the gin, and in cottonseed. Thus the complete destruction of the crop residue, and particularly the damaged, non-pickable bolls left in the field, is essential. The complete destruction of this residue is facilitated by the use of power-driven stalk shredders which reduce the stalks to small pieces that may be readily plowed under. Research has clearly shown that the earlier the stalks are destroyed and the crop debris plowed under, the fewer pink bollworms will survive the winter to attack next year's crop. This practice is most important in present recommendations for pink bollworm control.

Since the pink bollworm feeds primarily on green bolls, late in the season, the longer bolls are allowed to remain green the more heavily infested they become and the greater the damage to lint and seed quality. When it has completed feeding in the boll the pink bollworm usually cuts an exit hole through the outside of the boll and drops to the ground. These exit holes allow the entrance of boll rot organisms and during wet weather the loss from boll rot is often severe. Since chemical defoliation accelerates boll opening, this practice greatly reduces the pink bollworm infestation, damage to lint and seed and losses from boll rot.

The spinning quality of lint cotton may be seriously affected by the presence of "honey dew" from late-season aphid infestations. "Honey dew" is a sticky substance containing a high percentage of soluble sugars. When these sugars are present in excessive amounts, the spinning process is seriously hampered because the soluble sugars cause the lint to stick to the rollers of the spinning machines. Under most conditions complete defoliation will prevent this damage by eliminating the cotton leaves which are the food supply of the aphids.

Although the modern cotton production program is based primarily upon the substitution of mechanical power for animal power, there are certain other technological practices that are essential if mechanization is to be successful. Such practices as disease control, chemical weed control, insect control and defoliation are necessary to insure the production of maximum yields of high quality cotton at a minimum cost. The effectiveness of these practices is enhanced by the availability of mechanical power and some of these practices would be impossible without such power.

Insect control has been evaluated almost entirely on the basis of increased per-acre yields. Although this factor will probably always be the greatest single benefit to be derived from insect control, there are other important factors in a modern cotton production program that are directly benefited by an effective insect-control program. In most cases, these benefits can be obtained in addition to increased yields with little or no extra effort other than good management. On the other hand, there are several essential production practices that can be used to excellent advantage to increase the effectiveness of insect control at little or no additional cost. It is evident that insect control must be considered as a definite part of the production program if maximum efficiency in production is to be obtained.

Cotton Insect Control

(Continued from Page 70)

insecticides. Several field-crop insects are now reported to be resistant to insecticides that formerly were highly effective against them. In cotton it is known that certain species of spider mites are resistant to parathion. Experiments have shown that it now takes several times as much toxaphene to control leafworms as it did a few years ago. There was widespread failure of BHC to give satisfactory control of the cotton aphid in 1953.

We are not prepared to state that any cotton pest, with the exception of certain spider mites, is actually resistant to any insecticide, but we must face the fact that there is considerable evidence that resistance is being developed. In view of what has happened in the case of other insects, we would be derelict in our responsibility if we did not recognize this possibility and intensify our search for new insecticides and other means of controlling cotton insects. We have been extremely fortunate in cotton because several highly effective insecticides have appeared in close succession, and not one of them has been used exclusively over a wide area for several years. It is entirely possible that if BHC and toxaphene, the first organics to be used widely against the boll weevil, had been used exclusively, we should have already found resistance of that insect to these insecticides. Chlordane, aldrin, dieldrin, and heptachlor came along, and their use may have helped to delay the development of resistance. It appears that endrin and other new insecticides are coming into use, and they may further delay resistance.

The economic impact of any one of the major cotton insects suddenly becoming resistant would be terrific. Suppose the cotton leafworm were to make an early appearance and spread rapidly throughout the Cotton Belt and none of the recommended insecticides would control it! Losses would be staggering. The same would be true for the boll weevil or the bollworm.

However, the picture is not altogether dark or gloomy. There are bright spots. Almost every year one or more new insecticides are recommended for the control of cotton pests. This year, for instance, we find endrin and demeton (Systox) appearing for the first time in the list of generally recommended materials. Endrin has given outstanding results against the boll weevil and bollworm and has relatively long residual action. Demeton is the first systemic insecticide to be recommended for use on cotton. It is highly effective against the cotton aphid and spider mites and has long residual action.

Much has been said about systemic insecticides for cotton-insect control in recent years, and considerable progress has been made. Demeton is the most effective insecticide for the control of aphids and spider mites on cotton. It is the only systemic that is recommended. Recent research indicates that new systemic insecticides with a wider range of effectiveness may be forthcoming. Heretofore systemics have been effective against only a few of the sucking insects and spider mites. There are indications that certain new compounds may also be effective against thrips, fleahoppers, overwintering boll weevils and other pests when applied as seed or soil treatments. The advantages that would result from the development of such an insecticide would be tremendous.

Early destruction of cotton stalks as a means of reducing boll weevil damage the next season has been recommended for about 50 years, but it is only within the last 10 years that this practice has been successfully used to any extent. Even now it is practiced mostly in Southern Texas, although it appears to be gaining favor further north and east. This is encouraging. Use of the stalk shredder and destruction of the stalks on a community-wide basis have increased the popularity and success of this practice. This cultural measure has been extremely beneficial in reducing boll weevil populations and in suppressing the pink bollworm in certain southern areas where the cotton plant is completely destroyed immediately after harvest and several weeks before frost. It is anticipated that the use of stalk shredders and early destruction of cotton stalks during late summer or early fall will be greatly expanded in the next few years.

Considerable progress has been made in cotton production through the use of chemicals to kill insects early in the season. This treatment aids in accelerating growth, fruiting, and maturity of the plants, which make possible earlier harvesting and destruction of stalks. Sprays are more adaptable and economical than dusts for this purpose. The two- and four-row machines that can be attached to tractors for applying insecticides at the same time as cultivation have been of great benefit in many areas of the Cotton Belt. In the opinion of many people, however, this relatively inexpensive and efficient method of controlling insects has not met with as wide acceptance as it deserves. Then, of course, the low-gallonage six- and eight-row ground spray machines and aerial sprayers have been a big boon to cotton-insect control in many areas because under adverse weather conditions sprays can often be successfully used when dusts cannot.

In some foreign countries where the pink bollworm has become established, it is the number-one insect enemy of the cotton crop. Should it become firmly established across the U.S. Cotton Belt, many people believe that its damage would equal or exceed that caused by the boll weevil, which amounts to much more than half the average annual loss of $255 million from cotton insects. It required 28 years, beginning in 1892, for the boll weevil to spread from the Rio Grande near Brownsville to the Atlantic seaboard. Now, after 36 years, the pink bollworm is still confined to cotton areas west of the Mississippi River. The rigid quarantine, controls, and cooperative fight to eradicate, suppress, or prevent the spread of the pink bollworm are given credit for holding it within its present boundary. However, the rapid spread during the last four years has alarmed many people.

The pink bollworm spread to 42 new counties in 1950, to 19 in 1951, 49 in 1952, and to 15 in 1953, making a total of 125 newly infested counties during the last four years. The new infestation in 1953 included two counties of Arkansas, a state that had never before been infested, three parishes of Louisiana, and 10 counties of Oklahoma.

Perhaps the most significant phase of the pink bollworm infestation in 1953 was not the spread to 15 new counties, but rather the increased intensity of the infestation in portions of Central and Eastern Texas. Inspections in 187 counties of Texas showed decreases in 96 counties and increases in 91, most of the increases occurring in central and eastern areas. The higher infestations are attributed partly to winter carryover of larvae in these areas and partly to moth flight from the Corpus Christi area.

Foresighted agricultural leaders realized some time ago that the spread of the pink bollworm imposed a threat to the economical production of cotton. As a result, a greatly expanded research program to develop better methods of controlling the pink bollworm is now under way. It is a program sponsored and financed by federal and state agencies and industry. The new Pink Bollworm Research Center at Brownsville, Texas, which will serve as headquarters for the coordinated program, was appropriately dedicated on Jan. 24, 1954. The Cotton Gin and Oil Mill Press did an excellent job of describing this new research center—the buildings, facilities, staff, and lines of research now under way—in the Jan. 2, 1954, issue. This promises to be one of the most far-reaching cooperative research projects ever undertaken against a single insect. Success is expected but not guaranteed. We hope it may be possible not only to stop the further spread of the pink bollworm across the Cotton Belt but to push the pest back to limited areas in Texas and reduce to a minimum its damage and cost of control.

Joins Delta & Pine Land

J. E. HITE, Jackson, Miss., recently joined the sales department of Delta & Pine Land Co., Scott, Miss., to assist in the sales and distribution of breeders registered Deltapine and D&PL-Fox cottonseed. Hite, who is well known throughout the Belt, retired recently from the Bureau of Plant Industry, USDA. He assisted in the development of the one-variety program for California's San Joaquin Valley from 1928 to 1934, when he was transferred to the Mississippi Valley to carry on one-variety work. Hite will work with D&PL as a direct sales representative to producers of Deltapine 15 and D&PL-Fox and will assist distributors of the two varieties throughout the Belt.

Make Cotton Pay More in '54

Weed Research in Cotton

"For the first time the cotton grower has methods of keeping weeds under control with a minimum of spot hoeing . . . With these new techniques the grower may cut the cost of weed control by one-half..."

A. H. MOSEMAN is Director of Crops Research, Agricultural Research Service, USDA, Washington.

IN December 1941 Mississippi State College issued Bulletin No. 29 on Weed Control and Cotton Tillage. It is an excellent summary of a well-rounded study. It covers nearly 10 years of research on the control of weeds on Blackbelt or Prairie soils through tillage practices.

Looking over a copy not long ago, I found the final section in the bulletin took up the subject of chemicals in weed control. The discussion was confined to one chemical—sodium chlorate—and to tests in which it was used to eradicate Johnson grass in Houston clay soil.

I was impressed by the fact that only 14 lines—about one-third of a page—in a 64-page bulletin were required for the section. I believe this is an accurate measure of our concern with chemicals as weed killers at that time.

The information in that bulletin was of enormous value through the South during the next few years. December 1941, as you recall, was a significant month in history. After Pearl Harbor there was little opportunity to devise improved methods for controlling weeds. Farmers had to use the knowledge at hand.

• **Where We Stand Today**—You are familiar with the rapid developments of weed research over the past few years. Many scientists have had a hand in compiling material for some of the dramatic chapters in this brief history. Federal and state research staff members have worked closely with agronomists and others in industry. It has been a cooperative program from the start. No one man, agency, or commercial firm can take full credit for a single gain.

Here in the South the chapter in the weed research story that we review with greatest satisfaction deals with new methods for the control of weeds in cotton. They cover tentative guidelines for seedbed preparation, treatments with pre-emergence chemicals, the precise application of herbicidal oils after the plants are up, the use of flame cultivation, hand hoeing, and some tillage.

For the first time the cotton grower has methods of keeping weeds under control with a minimum of spot hoeing. Experimentally, this has been done with as little as four hours per acre. That is not quite one-tenth of the labor usually required.

Moreover, with these new techniques the grower may cut the cost of weed control in cotton by one-half — from around $18 per acre by the traditional method to about $8 per acre.

At this stage we can suggest only guide lines. Additional years of research will be needed before we can give accurate answers to some questions.

• **Precision Techniques** — The new approach to weed control in cotton is a precision job. Weed control is tied in with every step in production through the growing season. It begins with the thorough removal of crop residues from the soil. It requires the establishment of good drainage so that equipment for applying herbicides may be operated on schedule. It calls for smooth, firm seedbeds, plantings in rows of uniform width and height, and seed placement at a depth that gives adequate soil protection. It requires also the precise application of the herbicide and placement of fertilizer so the treated soil is not disturbed.

Pre-emergence treatments with either of two compounds marketed under various trade names—CIPC or DNOSBP —have controlled grasses and broadleaf weeds during the first six weeks after the cotton was planted. They have not given control of perennial weeds.

The evidence shows the weather is an important factor in the effectiveness of these compounds. Heavy rains following treatment or high temperatures (85° F.) immediately after the plants came up resulted in injury to the seedlings. High temperatures (90° F.) immediately following the application of CIPC reduced its value as a weed control.

Several new compounds are showing excellent promise as pre-emergence sprays. Among them are CMU (3(P-chlorophyenyl)-1, 1-dimethylurea) and 3-(3,4-dichlorophenyl)-1, 1-dimethylurea. However, these new ones have not been studied intensively enough to warrant general recommendations for their use in the cotton crop.

Non-fortified herbicidal oils, applied as post-emergence treatments, have given good control of annual grasses and broadleaf weeds in the seedling stage.

Results indicate the timing of post-emergence treatments is of great importance. Good control was obtained when the first treatment was made while the weeds were in the seedling stage. This was followed by up to three treatments, at least five days apart. Application of herbicidal oils, after bark cracks had begun to form, has resulted in injury to the plants.

By A. H. MOSEMAN

Findings in recent years underscore the importance of giving careful attention to equipment. It must be skillfully calibrated. The rate at which the herbicide should be applied depends upon several factors: the material used, the speed of the tractor, the pressure in the system, and the size of the jet. Helpful guides for calibrating equipment may be obtained from state experiment stations and a number of commercial firms.

• **Evaluation of New Chemicals**—Good farming continues to be the basis of a sound weed control program. We still have much to learn about the control of weeds through improvements in farm practices. But today the spotlight is on chemicals, and the emphasis in research is on chemical controls. An important line of work is concerned with the evaluation of chemicals of potential use as weed killers. In the three years since this work was begun, Dr. Warren Shaw and his co-workers have studied the effects of more than 400 compounds for the control of weeds in 30 different crops. The research has begun to pay off in knowledge that certain of the compounds have a high toxicity for weeds and are remarkably selective.

We are concentrating federal-state research resources on one group of compounds at a time. Chemicals in the first group to be studied—the carbamates—have exhibited a type of selectivity greatly needed for the control of weeds in cotton and other important crops.

We still have many more problems than we have answers, and so one of our most pressing concerns is which paths shall we pursue? Opportunities for further study have now opened up in every segment of the work. How can we sort these projects out to make the most fruitful use of the time, the skill, the funds, and equipment that are available?

Progress in research, like progress anywhere, is achieved most effectively

(Continued on Page 78)

Make Cotton Pay More in '54

GOOD DEFOLIATION is essential for efficient mechanical picker harvesting.

"Those seeking to discover the perfect cotton defoliant have a more precise set of specifications at hand than ever before."

By W. H. THARP

A Balance Sheet for Cotton Defoliation

COTTON GROWERS throughout the Belt are asking two very pointed questions. The first was echoed in a recent issue of this magazine in an article entitled—Wanted: A REAL Defoliant. Growers want to know when they can look forward to having a series of chemicals that can be used effectively and reliably as cotton harvesting aids. And, while awaiting this development, they are asking again and again for better, more specific, and more reliable guides to the use of chemicals now available.

In this article there is no attempt made to outline the exact manner in which better defoliation knowledge can be brought to the man who uses the chemicals. Nor is this to be a prediction of when we can expect to come up with that series of chemicals which, together with the know-how, will assure that growers can get rid of their leaves at the exact time when they want them shed.

It is rather the purpose to summarize the gains made in defoliation research during the crop year of 1953. No better way seems evident than to outline briefly the research reported at the Eighth Beltwide Cotton Defoliation Conference, held in Memphis, Jan. 14-15. In so doing, it is important to caution that much reported at this conference is preliminary. Continuation of some studies may significantly alter conclusions that might be hastily drawn from only these preliminary results. Today's cotton grower, however, is demanding that he be kept advised of research gains while they are being developed. He wants to use his own good judgment in deciding the ultimate worth of new farming information. So, in this article you will find a review of 1953 research in cotton defoliation strictly as it was reported. (The full details of research reported herein will be found in The Proceedings of the Eighth Beltwide Cotton Defoliation Conference, to be published in March 1954. Address request to the National Cotton Council, Memphis.)

Basic defoliation research is still being aimed at a better understanding of the exact mechanism of abscission—the plant process that cuts off the leaves. In California, Addicott and Walhood found that both the leaf blade and the petiole (leafstalk) must be chemically injured for most efficient leaf fall, that the—"ideal defoliant is one which produces from a mild to a severe injury to the leaf blades and at the same time a mild injury to the petioles." In Texas, Johnson and Hall found that removal of some leaves and/or bolls had a distinct effect on rapidity of natural abscission of remaining leaves. Studies with growth regulators by Thomas in Arkansas show that napthaleneacetic acid was effective in retarding chemically induced abscission while Gausman and Cowley found that application of indoleacetic acid applied at flowering can increase defoliation efficiency whereas napthaleneacetic acid retarded abscission.

Addicott and others reported negative results with field defoliation using ethylene but demonstrated by laboratory tests that ethylene and auxin (indoleacetic acid) have a compensatory or antagonistic effect on the abscission process, probably both affecting the same plant reaction.

Light was indicated as necessary for rapid defoliation in Arizona studies conducted by Brown and Hyer while Lane, Hall and Johnson demonstrated that under controlled conditions the speed of defoliation is doubled for each 10° C. rise in temperature over the range of 15° and 35° C. No abscission occurred at 5° C., and between 10° and 15° C. only 25 to 40 percent abscission took place in 21 days.

The layman might well ask how this basic research has helped the actual practice. It means just this. Those seeking to discover the perfect cotton defoliant have a more precise set of specifications at hand than ever before. It is now realized that this "ideal" chemical may have to act on the abscission inhibiting chemicals found in the plant, either destroying them, blocking their action or counteracting their function. Help is seen for another group. Those advising the growers will now be able to point out that efficient and rapid leaf drop with present commercial chemicals may be entirely inhibited at 40° F., it is too slow to be practical up to 59° F., and

W. H. THARP is Principal Physiologist, Cotton and Other Fiber Crops Section, Agricultural Research Service, USDA, Washington.

Insects LEAVE . . . here.

more efficient as the temperature rises further to 95° F.

On the more practical or applied side it was shown by many research workers that the experimental compound, amino triazole, may do a better job of controlling regrowth than any harvest aid chemical as yet under study with cotton. Perhaps it may not be found entirely adequate for all situations but in 1953 the evidence was encouraging. In Texas it was tested at Weslaco, College Station, Temple and Lubbock to find that high dosages effect up to 85 percent defoliation and inhibit regrowth up to one month. Applied at lower concentrations as an additive to defoliants it increased efficiency or permitted a lower effective rate of the defoliant chemicals. It appears to be a systemic—is translocated upward in the plant. In Arizona they found that use of amino triazole at low rates (one-fourth to one-half pound per acre) consistently increased efficiency of other defoliants. At rates of one pound per acre and above it caused 70 percent defoliation without the aid of other chemicals. The lower rates also reduced second growth by 50 to 75 percent in three weeks following application. In the Mississippi Delta they reported less control of regrowth with rates below one pound per acre than with higher rates. In their dry 1953 harvest season they found no improvement in percent defoliation but an increased speed of leaf fall when amino triazole was added to commerical defoliants. Compared with maleic hydrazide, which has looked good in past regrowth control studies, it was found superior in Mississippi.

Several new experimental defoliants appeared in 1953. One of these, NP-1098, was found to show promise as a spray defoliant for the leafy cotton and high rainfall of the Southeast. A second, known as Phillips No. 713, shows promise for those tough-to-defoliate cases found so often in Texas and Oklahoma. No. 713 is a desiccant in part with a much higher potential for removing leaves than found in current "oil and penta" desiccants.

The following summary of commercial defoliant performance should be considered as both an analysis of test results and a brief survey of commercial use throughout the Belt during 1953. And, the viewpoint is strictly that of the writer.

Calcium cyanamid is still not topped in dusts for efficient leaf drop where plant conditions are ideal and dew adequate. The chlorate defoliants, either the chlorate-borate mixtures or the magnesium chlorate formulations, were more widespread in their use than previously —showing up well in the Midsouth where dry conditions were prevalent in 1953. The improved soluble sodium cyanamide was gaining favor again. Endothal showed increasing use but at some locations it seemed to be rather critically dependent upon plant and weather conditions. In a few locations in Texas, however, it has been found near the top of the efficiency list. Sodium ethyl xanthate (SEX) did not seem to have been as well adapted to varying conditions during 1953 as the chlorates and several other spray chemicals.

The lack of adaptability found in some defoliants, or need to be rather exact with the rate in order to fit the plant condition, was clarified by Plaisted at the Conference. His research at Boyce-Thompson Institute seems to have developed a screening process that separates the defoliants with a broad adaptability range from those which must have a rather exacting rate to be efficient for a specific set of plant and weather conditions.

There was a general feeling throughout the Cotton Belt this season, and it was clearly reflected in the Conference reports, that our current defoliants are being improved a little each year. Growers are learning better how, when and where to use defoliation. They are learning the true uses for desiccation. And, the grower is starting to really analyze his needs. This was most evident in the areas of greatest use, showing the importance of first hand experience in the know-how formulae.

The Eighth Defoliation Conference took a very careful look at a variety of evidence concerned with the use of chemicals that kill and dry up the leaves and other plant parts without causing much leaf drop. Most of our present defoliants are contact herbicides and, if used at rates higher than normally needed for defoliation, they may cause considerable kill and subsequent drying of the leaves, petioles, stems and even the bolls. Other chemicals, such as pentachlorophenol, when applied as an emulsion or in solution with diesel fuel, and at the prescribed rate, will cause rapid (overnight) kill and drying with little or no leaf fall. It is thus the purpose and the rate that are involved in desiccation as well as the chemicals.

The main issue in the Cotton Belt now is to determine exactly where and when the process of desiccation is needed as contrasted with the need to obtain efficient leaf drop.

Experimental evidence presented by Walhood and by Miller and Tavernetti in California; by Carns and Crowe in Mississippi; and by Green in Oklahoma (and by others in previous years) indicates that deliberate chemical desiccation with penta formulations tends to stop maturation of seed and fiber a little faster than where plants are efficiently defoliated.

Insects THRIVE . . . here.

These men found that spindle picked seed cotton and the machine stripped samples were trashier when fields were desiccated rather than defoliated. However, the ginned cottons were no lower in grade or staple and machine picking or stripping efficiency was not reduced when plants were desiccated.

Walhood reported detailed research from California showing that both defoliation and desiccation will reduce quality of lint and seed and may reduce boll size (and hence yields) if applied at any time prior to complete maturity—at least 38-40 days under San Joaquin Valley conditions. Earlier studies had shown that eastern climates and varieties permitted more rapid maturity, with defoliation causing no loss to bolls about 35 days of age—perhaps less in some locations.

Since it has been shown that desiccation does lower maturity values but little as compared to efficient defoliation, the questions that are being raised are mainly in regard to the proper state of crop maturity. Recommendations in nearly all states urge growers to wait until at least 50 percent of the crop is open before applying defoliants and these same advisors say that perhaps more than 60 percent of the bolls should be open before attempting thorough desiccation.

In the previous paragraphs the considerations have been primarily in the nature of answers to the ever pertinent question: "will it work?" The more specific questions answered were: what will work, and when, where and how can it be made to work most efficiently? There remains, however, one even bigger question to answer, and that is: "will it pay?"

Obviously cotton growers think defoliation will pay for its keep in the majority of instances else there would not have been at least three million U.S. acres involved in its use during 1953. The question being scrutinized by research then could be more specifically phrased as: Under what circumstances will it pay? And, just how do we strike a balance sheet to determine the farmer's gain from use of harvest aid chemicals in cotton?

One intensive bit of research in 1953 cast some doubts as to whether the grower can always assume a need for the use of defoliation without first making a detailed analysis of his own situation. Crowe and Carns conducted extensive studies in the Yazoo-Mississippi Delta in 1953, using seven widely separated test locations. They collected agronomic data and physiologic data, and they obtained economic information. At each location they had defoliated, desiccated, and undefoliated plots. All cotton was harvested with spindle pickers. They concluded that, "Under the climatic and resulting plant conditions in the Delta in 1953" . . . a year of drouth causing considerable natural defoliation before harvest . . . "this study indicates that there is only a slight tendency for defoliation to improve the quality of cotton." They found no evidence that earliness was increased by the practice and only small improvements in picker efficiency.

This "will it pay" spotlight was focused on other places. Miller and Tavernetti concluded from results of their research in California's San Joaquin Valley, that . . . "It appears that there is definitely a possibility of economic benefits from the practice of defoliation due to increased grades but little if any benefit from the standpoint of increased mechanical picking efficiency (except in special cases such as of lodged cotton)." Williams and others reporting from South Carolina concluded that the Southeast has much to work out. They need better defoliants—better second growth control. Even so, they state: . . . "the results obtained have been worth more, in improved grades, than the cost of the application."

Two special reports to the Conference have a significant bearing on the "will it pay?" question. Dr. F. C. Bishopp, director of the Pink Bollworm Research Center, presented a review of past and current research by entomologists showing that defoliation now has an important place in the insect control program, particularly where clean-up and plow-under procedures are a vital part of the control plans. His report showed, however, that considerable improvement is needed in the chemicals now used to aid the pink bollworm control program. The ultimate need there is to either kill the entire plant on a given date or to dry it out thoroughly and prevent any further regrowth. So! The sign has been posted here. "Wanted! An effective growth-stopping chemical."

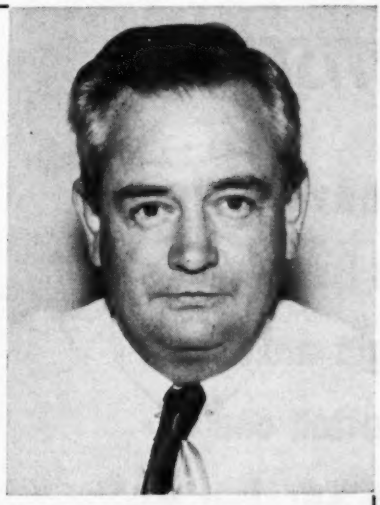
The other special report was presented by Dr. E. E. Berkley, director of the ACCO Fiber and Spinning Laboratory. He dealt at length and in specific detail with the industrial value of fibers from defoliated and desiccated fields, particularly with machine harvested cotton. He was concerned mainly with the fear that wholesale employment of harvest aid chemicals for purposes of speeding up the harvest was leading to use of defoliation, and particularly desiccation, long before cotton was mature—before it had reached the 50-60 percent open stage. This practice not only tends to reduce possible yields but it also makes the fibers immature and too fine for proper spinning. In this same connection he pointed out that the use of the micronaire machine (used to measure fiber fineness) was increasing to the point where cotton may soon be bought on the basis of fineness. And, in the almost immediate future, premature desiccation or defoliation might be reflected as a discount on the price paid the grower for his lint. He offered this statement for consideration: "Grade is no longer a measure of price."

Finally, the discussion of this year's entries on defoliation's balance sheet should re-emphasize the idea expressed so well in Claude L. Welch's address of welcome to the eighth Defoliation Conference—namely, that the gains made in research need to be put into use more rapidly. Since these gains continue to be made as a thin layer each year, the story told the grower will not be one of revolution in the field of harvest aid chemicals. It will be more a story of the steady progress of evolution. Many things are yet to be accomplished. On the other hand, there is a distinct trend

Ginners Must Help Cotton Growers

By CARL MERIWETHER

President, New Mexico Cotton Ginners' Association



■ GINNERS: What do you plan to do about the greatly reduced acreage which will be planted in your gin territory in 1954? What steps are you taking, or what steps do you plan to take, to see that top production is reached in the fewer acres which you will have in production? This matter is not only important to you, but to the farmers you serve. Since you are, of necessity, a leader of agricultural life in your community, you can have a profound influence on the producer to use every possible good practice to increase per-acre yields. Such action will not only partially offset your reduced volume through increased per-acre yields, but will enable your producer to survive better the battle of higher costs of production versus reduced acreage.

Some of the key points you will need to emphasize are proper insect control, proper and sufficient fertilizer, economic weed control, encouraging good farming practices, and above all, encouraging proper harvesting methods, so that you will be able to deliver the highest grade and staple possible to the producer.

I attended the cotton quality conference which was held in Clinton, S.C., on Jan. 19-20. There is no question but that cotton is facing tougher and tougher competition from synthetic fibers. There is also no question but that the spinners will be able to demand and get better quality of cotton for the spinning industry. Not only must you be the leader in good farming practices, you must also examine closely your own ginning operations to be sure that you give the best possible job of ginning to the producer. In order to do this, you may have to take part in educating the producer on his growing and harvesting practices.

Ginners' associations are ready and willing to lend whatever aid you require. Act now.

toward more efficient use of the process and a much better acceptance of present knowledge in those areas of longest and most widespread use. Experience is but one form of education and it becomes clear that it should pay dividends to extend this education into other areas while waiting for the time when better chemicals and better know-how can be developed through research.

Weed Research

(Continued from Page 74)

and most efficiently by putting first things first. In spite of the remarkable advances in developing practical methods for chemical weed control in many crops in recent years, we still have many gaps in our basic knowledge that must be filled before we can move ahead vigorously on practical problems.

I am thinking of questions like these: How are chemicals absorbed and transported through the plant? How is the mechanism of chemical toxicity related to plant structures? What chemicals can we use that are suited for the higher temperatures and other environmental conditions in the South? These questions give a good idea of the complexity of the problem.

Another important point we must think about is this: How can we weave these research activities together to achieve advances of the highest order? It will take close coordination of joint activities. To help attain this, we have recently named a regional representative for USDA weed research in the South. He is Dr. William B. Ennis, State College, Miss., who is already well known for his leadership in weed investigations.

Doctor Ennis will represent USDA in meetings with state experiment station officials. He will help draw up plans for new cooperative studies and to make a continuing review of projects now under way. He will work closely with the representatives of the chemical and equipment industries in this region. He will coordinate the research of USDA scientists engaged in weed investigations in the South. At this time the group includes Dr. Donald E. Moreland, Raleigh, N.C.; Dr. E. W. Hauser, Experiment, Ga.; Vernon Harris, State College, Miss.; and Dr. Richard Behrens, College Station, Texas.

We have made only a beginning in our search for materials and techniques to bring a few of the most aggressive and persistent annual weed species under control. We are still far behind in the basic research which is needed as a foundation for an expanded weed control program in coming years.

But the groundwork has been well laid for weed investigations in the South. We have a good pattern of cooperation between public research agencies and industry. The studies are already paying off in results. These will increase as the work expands.

FACT

for ADVERTISERS:

■ Your advertising message in this issue will be read by cotton gin and oil mill men in every cotton and oilseed-growing section of every producing state—from California to the Carolinas and from the Gulf to the Canadian border.

• Castor Bean Facts Listed by Firm

INFORMATION on the production of castor beans in the irrigated areas of the Southwest is being distributed by the Baker Castor Oil Co., 524 B Street, San Diego, Calif. The publication, Mimeograph No. 108, contains general information on cultural techniques, harvesting and hulling methods and marketing procedures. Additional information may be obtained from the firm's field representatives and from county agents.

Castor beans are not a poor land crop, the mimeograph points out. The crop will give really good returns only where planted on good soil and given good care. With proper care, yields of over 2,000 pounds per acre can be expected and yields in tests have been as high as 4,000 pounds per acre.

A new combination harvester-huller has been designed jointly by Baker and The Boardman Co., Oklahoma City. The machine is being manufactured on order by Boardman and some of them will be in use in 1954.

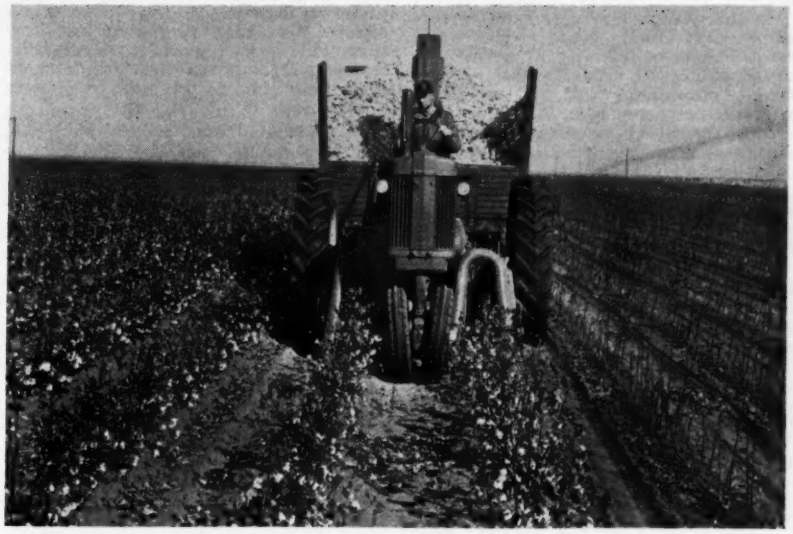
Advice Given on Planting Equipment Maintenance

With planting time at hand, J. T. Gaillard, Alabama Extension farm mechanization specialist, has the following suggestions on maintenance of planting equipment.

Always remove any protective grease before taking the planter into the field. Check operation with seed in the hopper. If the planter is ground driven, jack-up the drive wheel and turn it by hand. If it's driven from the rear wheel of a tractor, jack-up the tractor drive wheel and check the planter.

When not in use, planters should be stored carefully and all bright or land polished surfaces coated with grease or rust preventive.

Make Cotton Pay More in '54



HEAVIEST concentration of mechanical strippers in the Belt is on the South Plains in West Texas. Varieties grown there are ideally suited to this type of harvest.

"By familiarizing themselves with machines . . . and planning their entire operations to revolve around these machines, growers will increase their chances for success."

By DON L. JONES

Harvesting Cotton With the Mechanical Stripper

HARVESTING is one of the more expensive and the last farm operation of the crop year. Failure to point toward it can lead to unsatisfactory results. The mere purchase of a mechanical cotton harvester will not solve the grower's harvesting problems. First, he should change his entire previous thinking relative to cotton production, since taking harvesting out of the realm of hand labor and fitting it into industrial type farming can mean only constant changes and refinements. Substituting the machine for the human element in harvesting can mean reorganizing the entire farm layout. By familiarizing themselves with the machines and thinking in terms of planning their entire operations to revolve about them, growers will increase their chances for success and satisfactory machine performance.

Implements are expensive but, properly used, are the cheapest form of labor available; however, like most mechanical tools, the cost is set per operation.

Stripper Evolution

The cotton harvester, stripper type, like the tractor and combine, went through a long period of development. In this period, field performance data accumulated; engineering, farm acceptance, and cropping problems slowly emerged until a proper reading as to their end result could be evaluated. Some called for radical changes, others refinements; and some have not yet been satisfactorily solved.

The cotton harvester, stripper type, originated in West Texas under dryland conditions. Under the climatic conditions of this area, the plant infrequently grows to a height of three feet. Due to the short growing season cotton is not ready for mechanical harvesting until after frost. Under these conditions, the stripper, a once over, all over operation, is well adapted, as compared to the selective harvesting of the cotton picker.

During the evolution two basic stripping principles evolved: the finger and slot. Engineers have stayed with these principles, adapting and refining. The finger principle changed little, while the slot became the revolving rolls. As power drawn and mounted harvesters came into use, changes were necessary in the plant lifters, side and trailer elevators due to the tremendous amount of cotton which passes through the elevator conveyor in a short period of time. Under heavier yields, due to irrigation, more capacity was built in and wheel fenders provided to prevent loss of cotton on adjacent rows.

Using Strippers Today

Failure to take advantage of the many adjustments built into the implement and to steer the machine properly are frequent causes of unsatisfactory work. The driver must realize he is in command and that it is his responsibility to obtain the best performance possible under his conditions. He is one of the more important causes of poor harvesting.

The tractor is the work horse of today and in constant demand. The owners of tractor mounted machines rightfully are demanding greater ease and speed

DON L. JONES is Superintendent, Texas Experiment Substation No. 8, Lubbock.

in mounting, adaptability to various makes of tractors, more flexibility in height and provision for green boll separation.

The cotton stripper, as previously mentioned, is a once over, all over machine. The cotton plant is indeterminate in its fruiting habit. Thus, there is going to be considerable lag between the time the first and last bolls open. The longer cotton remains in the field the greater the chance for fiber deterioration even though the stormproof boll type has less cotton exposed than the normal. Likewise, it is more difficult to do a good job of harvesting. Late planting, failure to control insects, and unfavorable growing conditions result in uneven maturity and a late crop. In the drier area frost catches the crop; in the humid, fall rains. The stripper is not selective, and some form of separation between mature and immature cotton is desirable under the above conditions.

A farm developed device using a fan in the stripper elevator has partially solved this ever present problem of green bolls. Through gravity control the mature cotton goes to the back of the trailer, and the heavier, immature and green bolls fall to the front. The use of the fan has not completely solved the problem, but it is a step in the right direction.

The cotton breeder made his contribution by developing the stormproof boll type of cotton. The locks do not fluff but are firmly packed into the bur and will remain there for months. This prevents preharvest loss besides being much easier to handle by the conveyors. With the present strippers the grower will learn that the stormproof boll type of cotton s a must.

The agronomist, by observing the work of the stripper, was able to develop practices which resulted in more satisfactory stripper performance.

Improper crop residue disposal is often the cause for frequent stoppages and occasional breakage of parts. It is surprising how many broken sweeps, besides weeds and grass, the plant lifters can pick up.

Cultural Practices

Most implements operate on a specified row width. The use of narrower or uneven row width results in stripper losses and makes driving a much harder task.

In contoured fields the contours should be placed and so maintained as to prevent wet places which produce varying plant heights and uneven maturity. A little land leveling can often avoid ponding which produces the same effect.

Heavy planting rates cannot be overemphasized. Thick stands produce a more uniform plant growth, reducing height and vegetative branching. Side branches are easy to break and clog the machine. There are fewer bolls per plant, but yields are not reduced. The entire plant must pass through the stripping device; and the more uniform the material the better the machine can perform. While a certain amount of tolerance is built into any implement, the adjustments are not automatic; therefore stand regularity, plant height and type should be controlled as far as possible by the planting rate and consequent stand.

In laying out fields, the rows should be as long as possible to avoid unnecessary time-consuming turns. Long turn rows are advisable even if the ends have to be hand harvested, so that the driver has plenty of time and opportunity to get back on the row.

In the changeover from hand to machine harvesting, grass, vines, and weeds cannot be tolerated. Grass is next to impossible to separate from cotton fiber. Cotton mills will not knowingly purchase a grassy bale. Anything that affects the fiber adversely affects ginning, merchandising, fiber quality, and spinning. Vines can become entangled in the stripping mechanism, causing both stoppage and breakage. The stripper is not selective in its harvesting ability as is hand labor.

As supplemental irrigation comes into use over the Cotton Belt, the grower will soon learn that timeliness is more important than the actual amount of water applied. Water, applied at the wrong time, can result in excessive vegetative growth or a large amount of late, immature cotton. Proper use can be of untold benefit.

Soil temperature at the planting and germination period makes the difference between healthy, active growing plants and poor stands with weak plants. Normally, each area has a date, which, over the years has proven reliable, but agronomists now are leaning towards a simple soil thermometer that will give a correct reading as to when the minimum soil temperature warms sufficiently for planting, usually the mid 60° F.

The entomologist well knows that failure to apply the proper chemical at the right time, manner, and amount to obtain insect control not only results in loss of yield but also makes mechanical harvesting more difficult. Just to mention two insects: the fleahopper which distorts the plant type and the bollworm that will spot the cotton. Again, the stripper is not selective but gathers everything.

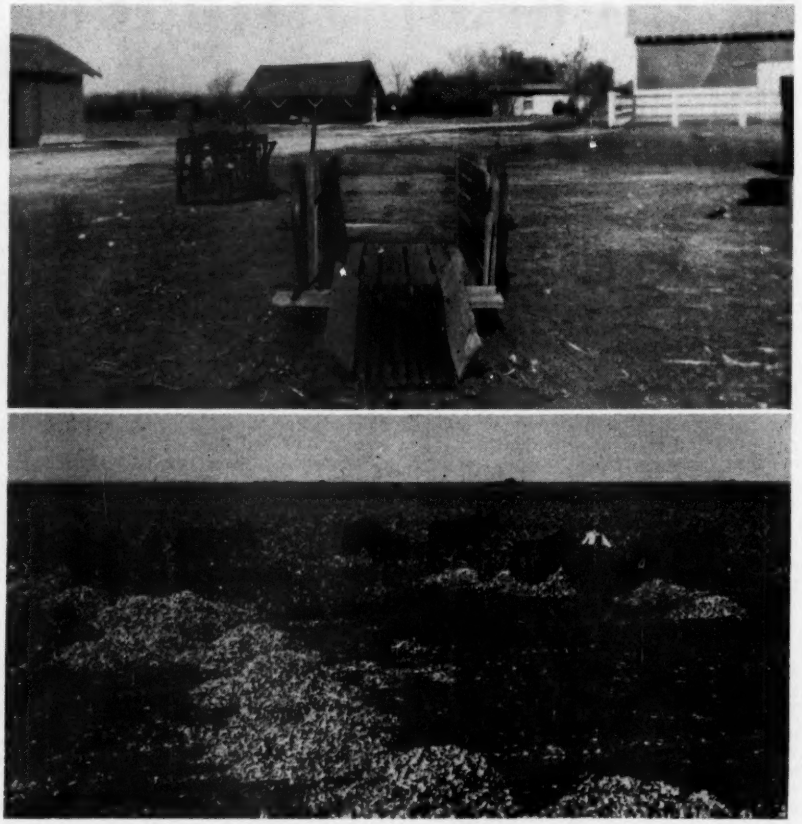
The plant pathologist recognizes the need for use of seed disinfectants that will help control seedling diseases, one cause of the skippy stands. Proper rotation to hold down root rot not only prevents yield losses but also loss of time in stoppage to unclog the stripping device.

In the short growing season of the High Plains area of Texas, defoliation, at present, is not as necessary as in the longer growing and more humid areas. Excellent defoliants are now available under certain conditions. The ideal defoliant for all areas and all conditions is not on the market. More chemicals are appearing on the market each year and are being evaluated for their effectiveness and as to whether they produce any injurious effect upon cottonseed and fiber. This necessary tool for successful mechanical harvesting is rightfully receiving a large amount of attention.

Gins Are Helping

The cotton ginner and gin manufacturer have played an important role in the cotton stripper mechanization story. It was not an uncommon sight,

TOP PICTURE shows an early-day sled-type harvester used on the South Plains in West Texas. Mule-drawn strippers, below, were a big improvement. Today's stripper, shown at the beginning of this article, does a faster, cleaner job and has helped to make Texas' South Plains one of the world's most important cotton-producing areas.



when hand snapping and stripping first started as a practice, to see farmers running their cotton through threshing machines to prepare it for ginning. Preginning cleaners to prepare the cotton and bur extractors were soon on the market to be followed by driers, humidifiers and lint cleaners. Without these necessary adjuncts to the gin stand proper, which resulted in maintaining the high quality of hand harvested cotton, the cotton stripper would not be an accepted tool in adapted areas.

To be an economical implement the cotton harvester must make the user money. Under present prices, if used properly, it will save approximately $30 a bale in harvesting costs. In addition, it can effect major savings in housing for labor plus the wear and tear of nerves so often encountered in handling seasonal labor.

In summation, the agricultural scientist and industry have made the stripping of cotton possible. Its degree of success depends upon how intelligently the farm operator applies the "know-how."

Proper Water Use

(Continued from Page 69)

the 1952 experiment (Table 1) indicate that several factors of quality were reduced by the very dry treatments, but there was no significant difference between the other treatments. There was a significant decrease in seed size and upper half mean length of lint and an increase in number of dead seeds and a downward trend in breaking strength in the very dry treatment compared to that of the medium and wet treatment. These trends were more noticeable in the first picking than in that of the second. The lint quality of the wet treatment was always equal to or better than that of any other treatment.

With the marked yield response to moisture differentials in 1952, an experiment in 1953 was somewhat expanded. The very dry treatment was omitted and more emphasis was placed on the wet end of the moisture curve (Table 2). The 1953 experiment also included nitrogen and date of planting differentials. There was a highly significant difference due to nitrogen application, but since there was no interaction between nitrogen application and moisture or date of planting, the differential nitrogen yields are not shown. The yields shown in Table 2 are from the plots which received adequate nitrogen application.

The yield trends in 1953 were quite similar to those in 1952 although the magnitude of the differences was somewhat less. Soil moisture treatments markedly affected the yield of both the early and late plantings but the effect was the greatest in the case of the late plantings. The moisture x date of planting interaction was highly significant. The yield of the very wet plot was greater than that of any other treatment.

Plant height was also increased by the more frequent irrigations but there was no indication of excessive height or vegetative growth. These results emphasized the need for adequate soil moisture throughout the growing season. A moisture stress during any part of the growing season reduced plant height and yields. It is felt that these principles will hold over much of the irrigated region although the actual irrigation practices might be quite different. It should be recognized that climatic conditions are extreme in Imperial Valley with high summer temperatures and longer growing season than is experienced in most of the irrigated cotton-growing areas. Likewise, the depth of rooting appears to be considerably less than reported in some of the other irrigated cotton-growing areas. Observations under Imperial Valley soil conditions indicate that the heaviest concentration of roots is found in the upper 18 - 24 inches and only occasional fibrous roots extend below 24 inches with a maximum penetration of about 42 inches.

The research on the relation of soil moisture to cotton production may be summarized as follows:

1. Adequate water is one of the most important factors affecting the yield of cotton.

2. Research for the humid region (Arkansas, Missouri, and Georgia) indicates supplemental irrigation pays good dividends, especially where adequate fertilizer usage, insect control, and other good management factors are practiced.

3. In certain parts of the Great Plains area, the length of the growing season may limit the amount of irrigation water that can profitably be applied. Maximum yield may be obtained with only one or two irrigations.

4. Where the length of growing season does not limit growth, ample water at all times is necessary for maximum growth. Both yield and quality are reduced when cotton plants are allowed to suffer from water shortage at any time during the growing season.

5. Cotton grown under dryland conditions of the high plains is very sensitive to small amounts of increased available water. Moisture conservation practices such as contour farming, terracing, etc., are important money-making practices which must be followed for maximum yield and net return.

Table 2. The effect of soil moisture treatments upon the yield of early and late planted cotton on a Hillsville silty clay—stratified phase in Brawley, Calif., in 1953. Yields are from plots which received 240 pounds of nitrogen per acre.

Soil Moisture [1] Treatment	Early Planting Bales/A.	Late Planting [2] Bales/A.	Mean Bales/A.
Very Wet—⅛ atmosphere [2]	3.02	2.85	2.94
Wet—⅔ atmosphere	2.74	2.69	2.72
Medium—2 atmosphere	2.77	2.19	2.48
Dry—6 atmosphere	2.12	1.98	2.05
Wet—Until early bolls open, then dry	2.30	1.95	2.13
Dry—Until early bolls open, then wet	2.39	2.54	2.47

[1] All plots were kept wet until fruiting stage (July 1). Differential irrigations were started at this time.

[2] The 8"-16" depth was allowed to reach the indicated stress before irrigation.

[3] Early planting made in moist mulch on April 17 and late planting was irrigated on June 1.

• Mandatory Linters Factor Proposed

USDA has announced a proposal to make mandatory at an early date the use of a cotton linters factor in determining the grade of cottonseed. The grading system was revised in 1952 to provide for optional use of the linters factor. Interested persons may submit statements concerning the proposed amendment before March 15 to the Director, Cotton Branch, USDA, Washington 25.

Make Cotton Pay More in '54

Harvesting Cotton With The Spindle Picker

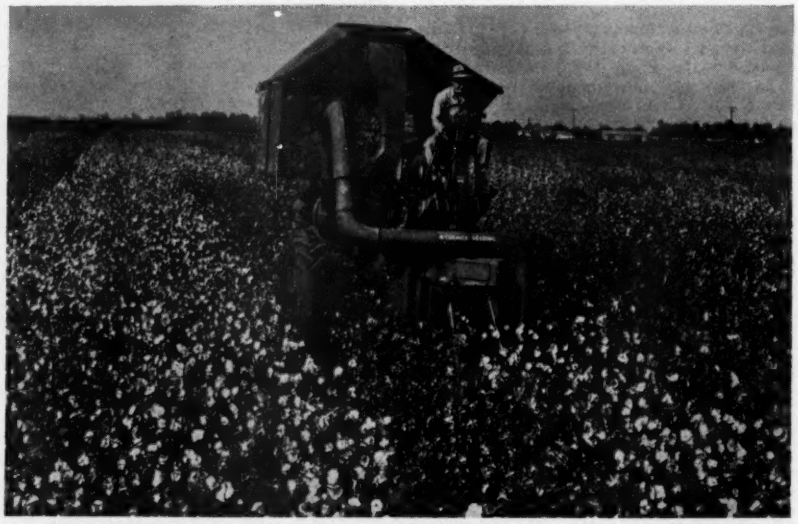
"Machines are off to a good start, considering the length of time they have been in production. The future should see continued improvement . . . as manufacturers lower production costs and increase efficiency of machines."

By O. B. WOOTEN

THE FIRST patents for mechanical harvesters for cotton were issued in 1850. Ninety-two years later the first commercial spindle type picker was announced ready for commercial production. Although World War II held up production of the first successful picker, 1,200 machines had been produced by 1948. In the last five years, three other companies have completed developments and have gone into production with additional spindle type pickers. The improvement of existing picking equipment and development of new machines is currently under way by several farm implement manufacturers. By 1952 there were 12,000 spindle type pickers on farms across the Cotton Belt.

The continued upward spiral in prices of machinery, repair parts and labor, plus variations in cotton yields from year to year, make it difficult to establish an accurate cost of mechanical picking. In determining the cost of machine harvesting, less than one-half may be charged to labor, fuel, repairs, and depreciation; while the remaining costs consist of grade and field losses. Machine efficiency greatly affects the latter loss.

O. B. WOOTEN is Agricultural Engineer, USDA-Mississippi Agricultural Experiment Station, Stoneville.



EACH YEAR, more and more mechanical pickers harvest a larger proportion of the cotton crop. They are helping to overcome a shrinking farm labor supply and lower cotton production costs.

• **Machines Cut Costs**—One of the big advantages gained from the use of labor-saving machinery today is its timeliness. The fact that machines are ready for cotton harvesting any time they are needed has a tendency to cut down the charge against grade loss. By reducing the length of the average harvest season through the use of machines, it is possible to harvest a higher percentage of the cotton before winter rains arrive. Therefore, the grade losses of early machine picked cotton may in the end compare favorably with average hand picked grades that include a great deal of late harvested fiber.

High picking efficiency has been the primary goal of cotton picker manufacturers, and to some extent improvement has been made since the first machines were introduced. Seed cotton losses are particularly noticeable behind a cotton picker, while losses sustained by other types of mechanical harvesters, such as those found behind combines and corn pickers, are not as readily detected. A close examination of the cotton plant after picking often reveals considerable insect damage and immature locks in the remaining bolls. This should not be charged as complete picker loss since the faulty cotton should not be picked anyway.

Many farmers use their machines for scrapping or salvaging operations on residue cotton remaining in the fields. Since the cost of machine operation is charged largely to depreciation, more picking per season would, of course, spread this cost over more bales. This reduces the per unit cost of picking.

Despite the various problems that spindle pickers have faced, cost studies consistently show that picking with machines is cheaper than picking by hand methods.

Research by Experiment Station engineers across the Cotton Belt has often consisted of cooperation with the manufacturers in testing new or auxiliary devices and in determining the cultural practices that are conducive to high picking efficiency.

• **Advance Planning Pays**—Farmers experiencing the greatest success with their cotton pickers are the ones that are improving their farming operations prior to harvest time. Drainage and field layout should receive careful consideration before planting.

Drainage problems are magnified in mechanical cotton production. The elimination of wet spots in the field will increase the uniformity of picking across the field. The cotton picker, which is both large and heavy, needs firm soil on which to travel. Soft spots that keep the picker out of the field may result in

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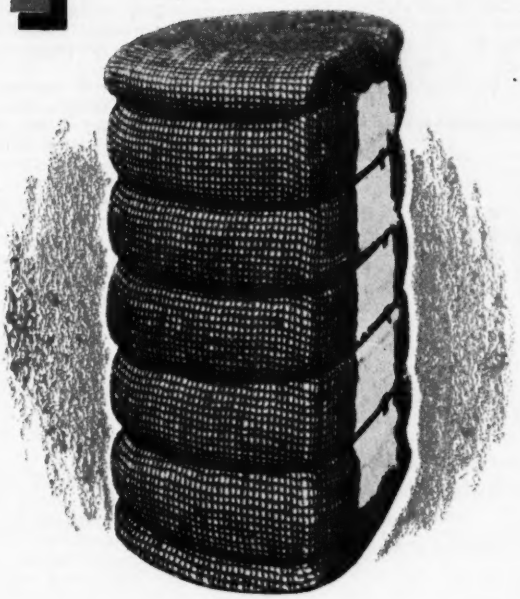

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loss of much of the timeliness associated with mechanical harvesting.

Important features of good field layout are long rows and adequate room for turning. The turn rows should be wide enough to allow the picker to enter the row squarely at full speed. When the picker is turned in extremely short spaces, the stalk gatherers contact the first plants on the row at an angle which causes many bolls to be missed by the picking unit.

Time spent in the removal of stones, bricks, scrap iron or other foreign materials from the fields is well worth while. When objects of this kind pass through the drum they cause machinery damages that result in expensive repairs. The loss of time in making these repairs tends to eliminate the advantages gained from the timeliness of mechanical harvesting.

• **Cultural Practices Important** — Cultural practices which have a bearing on mechanical harvesting begin with seedbed preparation and extend through "lay-by." Research has shown that plant population and spacing have a definite bearing on picking efficiency. High plant populations tend to restrict the size of the plants and force the lower fruiting limbs higher on the stalks. The uniform flow of evenly spaced plants through the machine also increases picking efficiency. Although a definite population cannot be prescribed for the entire Belt, the optimum range is from 30,000 to 50,000 per acre in most areas.

One of the oldest customs in cotton culture is "dirting"; that is, cultivation of the crop in a manner that piles loose dirt around the cotton stalks. This practice should be avoided if mechanical harvesting is to be accomplished efficiently. "Dirting" the drill results in a peaked row and leaves the lower limbs of the plant close to the ground. Loose soil and clods passing through the picker drum result in stoppage and excessive wear to the spindles. Exceptions to this will necessarily be found in those areas where the deeper middles are required for irrigation.

Grass control, particularly just before "lay-by," is essential if additional grade losses from grassy cotton are to be avoided.

Good insect control and effective defoliation usually have a direct bearing on picker efficiency. Full, fluffy undamaged bolls and sparse foliage tend to raise the percent of cotton recovered by mechanical harvesters.

Tests comparing wetting agents and textile conditioning oils with water have been conducted to determine the possibility of reducing the amount of water required in picking. Under ideal conditions the textile conditioning oils proved efficient; but since they did not clean the spindles as well as other agents, they have generally been abandoned as possible picking aids. On the other hand, the detergent quality of wetting agents is especially beneficial in keeping the picking spindles clean under adverse picking conditions.

• **Supervision Needed**—After the crop has matured and is ready for harvest one of the largest factors governing efficiency is the human element. The supervision and maintenance in field operations are both very important, regardless of whether the owner operates one machine or a large fleet. A thorough maintenance program backed up by competent operators will result in a lower cost of picking per unit. Dealer schools have been helpful in improving the know-how of the operator.

The numbers of problems presented in machine harvesting of cotton are greater and more varied than those in harvesting any other major crop. Other crops are harvested in one operation while the cotton picker must be selective and leave the green, unopened bolls for a second picking. Separation of foreign material from the staple product of other crops does not present the problem that is presented with cotton.

The highly visible machine losses coupled with the high maintenance costs of pickers have comprised some of the main problems confronting the owners and prospective users of mechanical harvesters.

Even with these problems and drawbacks connected with mechanical cotton picking, the machines are off to a good start, considering the short length of time they have been in production. The percentage of machine picked cotton is increasing yearly across the Belt.

The future should see continued improvement, and the popularity of mechanical pickers should increase from year to year as manufacturers lower production costs and increase the efficiency of their machines.

■ **CARL C. FARRINGTON, Archer-Daniels-Midland Co., Minneapolis, Minn., has been named chairman of the National Grain Trade Council.**

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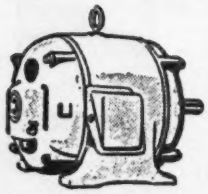

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Conservation

(Continued from Page 16)

the South in building better soils? Soil conservation leaders think so. Here is interesting comment from a number of them about significant soil conservation developments. Says E. W. Mundie, Virginia Extension soil conservationist:

"The program in soil and water conservation has gone forward during the last 10 years more than in any similar period of our agricultural history. Soil conservation districts have given excellent leadership to this program and afforded a medium through which Virginia people have been able to contribute their efforts to this all important movement.

"Hundred-bushel corn clubs and an improved pasture program have played important parts during the past four or five years in the development of the conservation program in Virginia. A large increase in the acreage of alfalfa and the change from open cultivated crops to grassland farming has likewise contributed greatly to an improved conservation program. There have been more farm ponds built in the past three years than in the entire history of our state. But perhaps the most important accomplishment of all is the change in attitude of Virginia people in all walks of life towards the conservation program. Virginia people are fast recognizing the relationship of a sound land use program to the economic and social well-being of the state."

"I think the first on the list (of soil conservation accomplishments)," reports W. R. Thompson, Mississippi Extension agronomist, "is pasture development because pastures will use land that should not be in row crops. There's half a million acres of land that was formerly planted to row crops on the steep hills that never did make anything anyway. These row crops have been shifted to better land and this is a big change in our crop rotation development.

"Another change that stands pretty close to the top in soil and crop rotation development is in the minds of the farmers. The farmer today is more conscious of soil erosion and soil conservation than he has ever been. Regardless of how much information or data we have to show that soil conservation is important, unless the farmer is in favor of it, we do not get very far. A lot of the old, once eroded, gullied, bare hills are now green. Travelers who pass over our state by plane cannot believe the change has taken place they see before their eyes in the grassland program. One traveler said he never got out of sight of a green area in crossing our state from one end to another."

According to Alexander Nunn, editor of the Georgia-Alabama-Florida edition of The Progressive Farmer:

"Going back 20 years, I would say the main achievements in soil conservation and crop rotation would certainly have to include the following:

"Adequate and up-to-date terracing systems and most recently, terracing systems for our rolling lands adapted to tractor farming.

"The switch from row crops to pastures—legumes and grasses. The large acreages of eroded and very poor land that have gone into trees, either by natural reforesting or by setting of seedlings.

"The fertilizing of pasture crops.

"The growth in popularity of deep rooted perennial legumes and grasses. Among the legumes, I would name particularly, Sericea, Kudzu, and alfalfa; among the grasses, the Bahias, the newer Bermudas, and the fescues."

Discussing the Southeastern territory served by the SCS office at Spartanburg, S.C., T. C. Maurer, regional agronomist, says, "The Soil Conservation Service program is now in the process of rapid change from rotations using annuals to perennial grass-based rotations.

"A number of well-adapted multiple purpose grasses have been introduced into the state of South Carolina over a period of years. Bahia, fescue and Coastal Bermuda grasses are being established on large acreages throughout the state. Most of these grasses are used in combination with adapted legumes for grazing. However, as the acreage of grasses increases, a number of fields are plowed up and followed with row crops. Yields have been unusually good, even with the extremely drouthy summers of the past 13 years, following the turned sod.

"Farmers who have seen row crops following a sod are planning to plant grass as a part of their cropland rotation. There is a definite trend toward a fescue rotation for tobacco.

"A grazing program using adapted perennials is being developed. Lespedeza Sericea has proven its drouth resistance carrying capacity and its ability to stand abuse when other crops had quit growing. A big increase in Sericea acreage would be planted if the seed supply were plentiful this year.

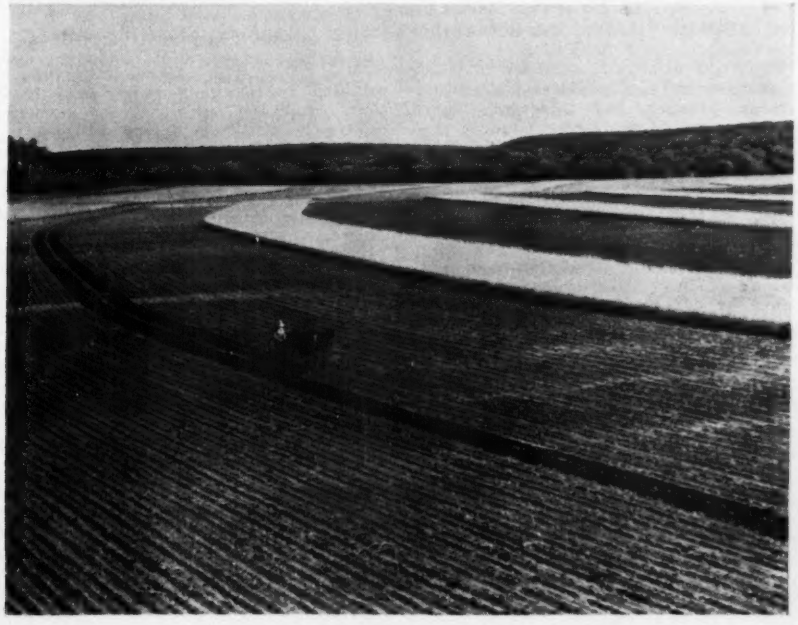
The value of Kudzu has been re-emphasized again by the dry weather in late summer and fall. Also the direct seeding of Kudzu has reduced the labor required for planting seedlings or crowns. There are many unproductive acres, eroded and gullied, that should be maintained in Kudzu as reserve grazing.

"Winter cover crops have been increased through the use of Blue Lupine, reseeding crimson clover, early hairy indigo, Caley peas and Button clover. The use of crotalaria has been extended successfully, particularly in the Sand Hills. Increased yields of cotton and corn have been obtained where crotalaria has been maintained in the soil conserving rotation."

And, finally, R. Y. Bailey of the SCS points out that, "Grass rotations are being accepted far more readily than I anticipated when we started with them. As a result I believe we are well on our way toward better treatment of our sloping lands."

Summing up, we can say that magnificent progress has been made in finding the best combination of soil conserving practices for our great diversity of soil types, farming systems and climatic conditions. Much emphasis is being placed on crops that increase the organic content of Southern soils. Organic matter is recognized as our greatest need. But commercial fertilizers are being used liberally and profitably not only to produce more organic material but also to supply plant food deficiencies for row crops. Progress is being made in getting rough land back into trees. Southern farmers planted more than 100,000 acres to trees in 1952. But there are 17 million acres in the South that should go back to forests. All in all, the South is doing the best job of farming it has ever done when measured by the progress being made not only in farming profitably but for the land's sake.

EVEN THOUGH this field in Coryell County, Texas, has only one percent slope, it is protected by contour cultivation and strip cropping.



National Cotton Week Plan Book Issued

An illustrated, 20-page retail plan book for National Cotton Week, May 10-15, has been issued by the National Cotton Council. Thirty-five thousand copies are being distributed to stores, wholesalers, manufacturers, newspapers and others. The book offers a display kit including Cotton Week posters, banners, streamers and card toppers.

Make Cotton Pay More in '54

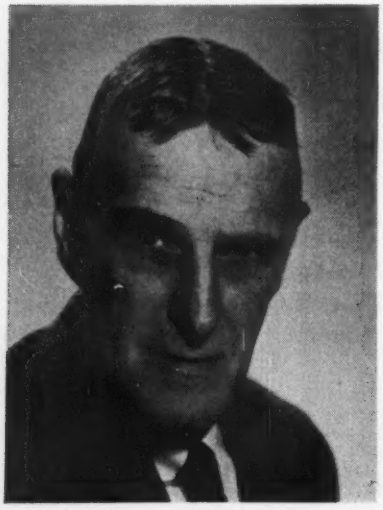
Ginning Research at the USDA Laboratories

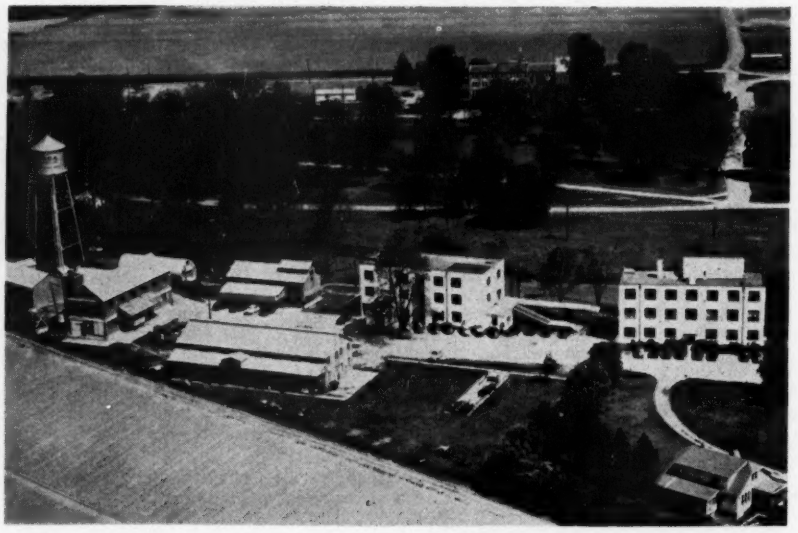
"A primary aim of research in ginning is still to eliminate current losses and enhance the grade and preparation of each bale within profitable limits."

By CHARLES A. BENNETT

COTTON GINNING essentially is one of the elements of production, as is hay baling, corn shelling and the mechanical grading and cleaning of agricultural products in general. As the cotton industry knows, the bale of ginned cotton usually belongs to the producer for an indefinite period following the ginning. The results of the ginning processes have within a few minutes established the characteristics of the ginned fiber as to its grade and staple and have also fixed the cleanness of the ginned seed. It is true, of course, that every phase of agricultural production affects ginning, which in turn affects marketing and utilization; but ginning is still a relatively local operation before the first sale of lint or seed by the farmer. Ginning does not change the basic form of the seed and lint commodities involved, nor does it alter their basic physical form or chemical composition. For these reasons, cotton ginning research is a part of the Department's broad cotton production research program.

CHARLES A. BENNETT is In Charge, Regional Cotton Ginning Investigations, Agricultural Research Service, USDA, Stoneville, Miss.





AERIAL VIEW of the U.S. Cotton Ginning Laboratory, Stoneville, Miss.

Within the past quarter of a century cotton ginning has undergone more change than in the entire hundred previous years, both as to its old art of roller ginning and to the newer applications of toothed-ginning principles that arose from Whitney, Holmes and other inventors at the close of the American Revolution.

Research does not claim to have caused all of these drastic changes, nor to have by any means completed its own job in crystallizing the processes into a fixed mold. Governmental research has, in fact, been only barely able to work upon the most urgent ginning problems that have arisen during the past 25 years, and it is reasonable to anticipate that its value increases as the horizon expands. Cotton shifts in locations, varieties, insect hazards, production, harvesting and marketing methods are increasingly fluid. These are causing continuous changes in conditions to which cotton gins must respond by means of prior or concurrent ginning research into a broad field of "phenomena."

Tests, trial runs and demonstrations do not necessarily constitute research, as such, but have frequently been confused with it through misinformation. Research, from one point of view, is an orderly collection of facts that are required to fill in the gaps of existing knowledge on the one hand, and to bridge the chasms of new conditions or provide new roads toward the objective, on the other. Consequently, the studies that the U.S. Department of Agriculture is engaged in during its cotton ginning research are both fundamental and applied or practical. As a part of these carefully planned programs with definite objectives, there are countless tests, trial runs and proving-out efforts —with known materials—so as to obtain factual results concerning principles and practical applications. Ginning research is not confined to test tube, shop, drafting board or fiber appraisal. It is all of these and more, united with an ideal of lasting service to American cotton producers, ginners, manufacturers and public consumers.

At the time when Congress acted to establish the Cotton Ginning Investigations after the successful development of the seed cotton drying process in Louisiana, the urgent need was to feasibly apply the process—a need which the Ginning Laboratory first satisfied through the vertical or tower drier.

Principles, actions and effects of each type of cotton ginning equipment were given careful study from the outset of the work in Stoneville, Miss., to find where the cotton was subjected to damage or improvement of any kind. In 1930 the conventional plantation and crossroads cotton gin was not elaborate, although there were a few expensive and extensive combinations of machinery at some locations in the Belt. An average plantation cotton gin of the Central South then used either pneumatic or belt distributors, spiked drum or small extractor-feeders, 60- to 80-saw gin stands, with 70-saw units being quite popular but giving way to the incoming 80's. Doffing was either by brush or airblast, but the gin fronts were frequently plain or single-rib huller out-

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Make Cotton Pay More in '54

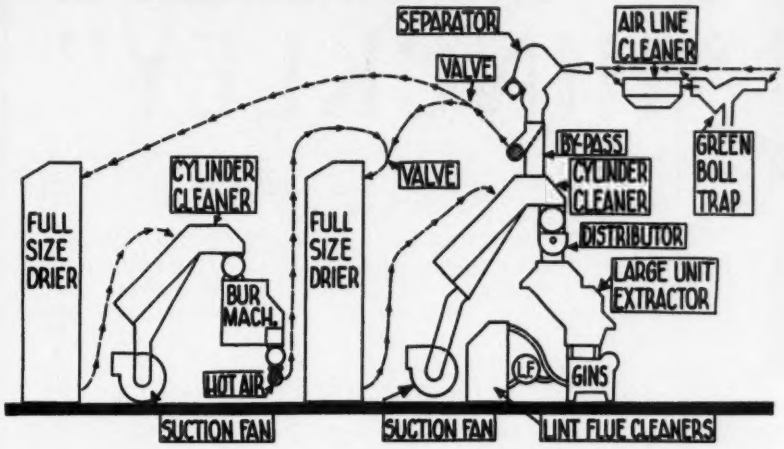


Figure 1. Diagram of the principal equipment in a modern gin.

"It will be to the benefit of all ginners to acquaint themselves with the ginning problems that arrive with the stripper."

By ALFRED M. PENDLETON

Machinery Requirements for Ginning Machine-Stripped Cotton

DURING 1952 and 1953 the harvesting of cotton by the mechanical stripper expanded rapidly in North and Central Texas. The stripper was also introduced, during this time, to many other sections of the Cotton Belt. Several hundred ginners have become acquainted for the first time with the ginning of cotton harvested by these machines. As a problem distinctly different from the ginning of machine-picked cotton, the ginning of machine-stripped cotton is raising questions in the minds of ginners from widely scattered sections of the Cotton Belt.

This article is prepared for the purpose of viewing these problems in terms of machinery requirements necessary for the handling of machine-stripped cottons. It is not a recommendation for the use of cotton strippers in any area; but rather is a presentation of problems encountered in the ginning of such cotton and a suggestion as to the use of machines to minimize these problems.

In matters pertaining to the ginning of machine-stripped cottons, it is necessary to understand the steps taken by the cotton ginning industry to handle types of cotton prevalent before machine-stripping became a harvesting practice of major interest. For purposes of cotton gin construction and operation, harvested cottons might be divided into four general classes: (1) hand-picked; (2) hand-snapped; (3) machine-picked; and (4) machine-stripped.

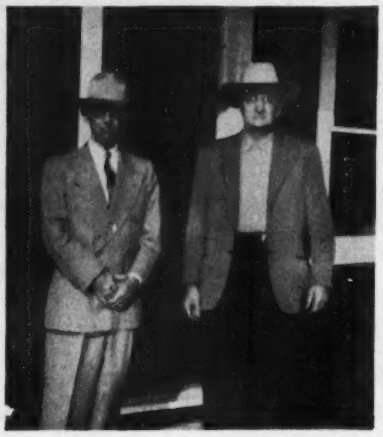
Hand-Picked Cottons — Dry hand-picked cottons can be satisfactorily handled on a ginning set-up composed only of a cylinder cleaner, large unit extractor-feeder, gin stands, and lint flue cleaners. To handle damp or dew-laden hand-picked cottons, a full size drier should precede this ginning set-up. (Locate machines on Figure 1.)

Hand-Snapped Cottons — Dry hand-snapped cottons, containing a minimum of green foreign material, have been satisfactorily handled by adding to the above set-up a pre-cleaner, a master bur extractor, and additional after-cleaning cylinders to total not more than 24 cylinders, or their equivalent, in the gin. (Locate machines on Figure 1.) In areas where large amounts of sand are brought to the gin in cotton so harvested, or in cases where dried-up knotty bolls need to be opened, an airline cleaner, or boll breaker, complete with by-pass, is usually added ahead of the drier. When this addition is made, the after-cleaning cylinders are reduced in number so that the total in the gin does not exceed 24 cylinders or their equivalent.

Machine-Picked Cottons—In the ginning of machine-picked cotton, an airline cleaner is rarely used because the first process should be the exposure of cotton to a full size drier. Except in areas of extreme moisture conditions, the drying process is followed in order by a cylinder cleaner, master bur extractor, and 7 to 17 cylinders of after-cleaning, followed by a large unit extractor-feeder, gin stands, and lint flue cleaners. In areas where moisture conditions at harvest time produce exceptionally damp seed cottons, such as in the Mississippi Delta area, a second full size drier is added immediately following a master bur extractor and preceding the after-cleaning cylinders. (Locate machines on Figure 1.)

• **Machine-Stripped Cottons** — From the above sketches of suggested machinery set-ups for handling various types of cotton, it may readily be seen that as harvesting moves further away from dry hand-picked cotton, so the cotton gin grows in size and costliness if it is to do a maximum job of cleaning and at the same time protect the fiber qualities inherent in our finer varieties produced today. *It is, of course, basic that no cotton should be exposed to more drying or cleaning equipment than is necessary* to produce a clean merchantable product. All machines should be installed with by-passes to al-

ALFRED M. PENDLETON is Extension Cotton Ginning Specialist, USDA, Dallas.



Another Prominent Gin Goes All "HINCKLEY"

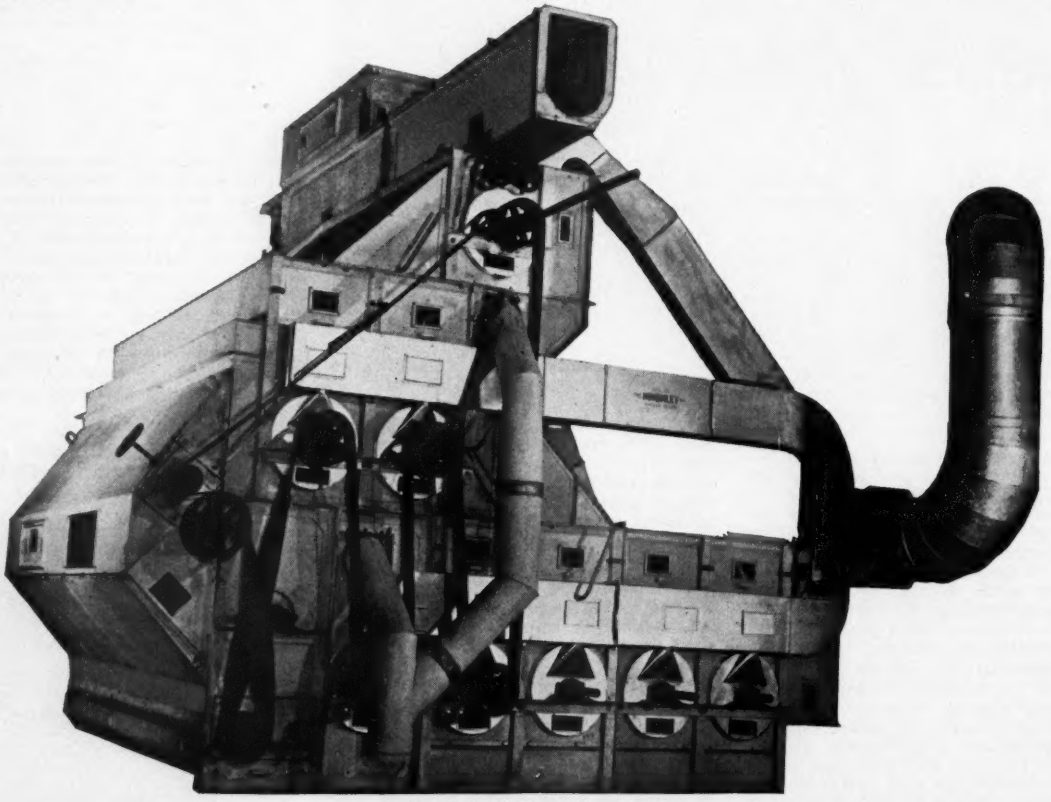
H. R. Crawford, left, and his partner Cobe Bowers, at their Planters Gin at Dell, Ark.

Back in 1948 these men were far sighted enough to realize that a gin must equip to handle roughly harvested cotton to stay prosperous. They also realized that their old stands and feeders were capable of producing an extremely smooth sample when fed clean, dry cotton. Thus the problem resolved itself into just what overhead equipment could do the best job of cleaning and drying without damaging the cotton.

Being familiar with the Hinckley FAN DRUM system, these men selected the Hinckley "Feeder Control" Master Unit to solve their conditioning problem.

After five ginning seasons and much competition from neighboring new gins equipped with lint cleaning, these men have proof that they made a wise decision when they went all **"Hinckley"** in equipping their gin for roughly harvested cotton.

This gin is known far and wide by cotton buyers and planters for its top sample and good turnout.



14 Ft. Hinckley Master Unit

HINCKLEY GIN SUPPLY COMPANY

4008 Commerce St. Dallas, Texas

The Fan Drum Is The Secret

"When Competition Is Keenest, Install A Hinckley"

GREEN bolls removed by boll trap.

low a selection of *minimum equipment* to avoid fiber damage to clean, hand-picked dry cottons. Cotton from the overflow should not pass through any of the overhead machinery but should be returned directly to the distributor.

Weight of moisture and trash removed should be carefully considered along with grade improvement in arriving at the *minimum* machinery to employ to attain *maximum* dollar bale value. Operation of all gin machinery on all types of cotton should be geared to the Four-Point Program for Better Ginning. At the same time, it is evident to those who have studied the ginning process that more equipment is necessary to handle hand-snapped and machine-picked cottons than to handle hand-picked cottons, either damp or dry. By the same logic, the successful handling of machine-stripped cottons requires the use of additional machines and a different application of the same machines as compared with handling the three types of cotton harvested by methods previously mentioned. For our purpose, therefore, we must subdivide machine-stripped cottons into (a) the problems inherent in the ginning of stripper-adapted varieties harvested in a dry condition after frost and containing little green foreign matter, such as geen leaf and green bolls; and (b) the problems inherent in the ginning of machine-stripped cottons harvested after defoliation but before frost and containing considerably larger amounts of green foreign material.

Machine-Stripped Cottons, With a Minimum of Green Foreign Materials, Harvested After Killing Frost.

In the South Plains area of Texas and the extreme western area of Oklahoma, the established practice of machine-stripping has been widespread and thoroughly successful, and has been satisfactorily handled in the cotton gin, when green foreign matter and moisture content have been held at a minimum. The following set-up has generally proved satisfactory: Airline cleaner, full size drier, pre-cleaner, master bur extractor, after-cleaner, extractor-feeders, gin stands, and lint flue cleaners. (Locate machines on Figure 1.) With green bolls held to a minimum, the airline cleaner (often installed with one or two high speed breaker cylinders) breaks up cotton burs, removes most of the sand and prepares the seed cotton for the drying process. After drying, the seed cotton is exposed to a cylinder cleaner which takes out small particles of sand, dry leaf, and other broken pieces of vegetation. In the bur machine, from 60 to 90 percent of the burs are extracted. The seed cotton is then exposed again to multiple cylinders of after-cleaning. In the extractor-feeder the seed cotton is again cleaned and most of the remaining burs are removed. The gin stands, in addition to separating fiber from seed, also do effective cleaning. The final process of lint flue cleaning applies only to the lint fibers separated in the gin stand. It removes approximately two pounds of waste fiber, together with motes and all manner of fine foreign materials clinging to the lint fibers when they are brushed or blown from the gin saws.

The above gin machinery set-up has done a satisfactory job for several years in the cleaning and ginning of machine-stripped cottons, particularly when they were brought to the gin in a dry or only slightly damp condition and when the harvesters were operated after all vegetative foreign matter was dead. This statement is not to infer that the ginning of large quantities of machine-stripped cotton is not more troublesome, more difficult, and more expensive than the ginning of properly handled hand-picked cotton, but it is intended to show a distinct difference in ginning problems and difficulties encountered when a large quantity of green foreign materials is brought to the gin, from whatever harvesting cause. Large amounts of green foreign material, such as green bolls, green leaf, green branches, and rolled-up green bark are associated with the difficulties of harvesting before frost and therefore require additional equipment.

Machine-Stripped Cottons Containing Green Foreign Materials Harvested Before Frost.

One of the most pressing problems the ginner faces in handling machine-stripped cotton following an incomplete defoliation (and most defoliations to date apparently are incomplete) is that of green bolls present in the seed cotton. Some cotton brought to the gin may contain 5 percent or more green bolls. For best grade and operating efficiency, these green bolls should not be beaten up in an airline cleaner but should be removed by one or more green boll traps as quickly as they can be eliminated. Once they are chopped up they cause all manner of difficulty, including choke-age in the gin saws. We must, then, be sure that the gin is equipped with at least one green boll trap. Even so, some of the green bolls usually follow the flow of cotton and may be broken up in the airline cleaner. The result is a well scrambled mass of green, soggy fibers and green boll pulp well distributed throughout the cotton sample. It is recommended, therefore, that where cotton is to be ginned containing many green bolls, the airline cleaner be eliminated to prevent this chopping process. In this case, the first drier cannot adequately remove moisture from seed cotton en-

(Continued on Page 93)

LOADS of machine stripped cotton awaiting turn at the gin.

Make Cotton Pay More in '54

The Outlook for Cottonseed Products

"Basically, the future of cottonseed products is good. To realize their potentialities, however, such products must be able to compete in terms of quality and price. Inability to do so will penalize crushers, ginners and producers."

JOHN F. MOLONEY is Assistant to the Executive Vice-President, National Cottonseed Products Association, Memphis.

By JOHN F. MOLONEY

THE WIDE VARIETY of factors and conditions that affect the market for any one of the products of cottonseed makes an attempt to discuss the general outlook for such products an extremely ambitious undertaking. The art of economic prediction has never reached a high degree of accuracy and is subject to considerable qualification and generalization. With these limitations in mind, it is nevertheless helpful, from time to time, to take an inventory of the principal factors currently operating in cottonseed product markets and of their possible future significance.

• **Cottonseed Oil**—Oil is the most valuable product of cottonseed, accounting for an average of about 55 percent of total product value. Once the only edible vegetable oil produced in the U.S. in substantial quantities, cottonseed oil now ranks second to soybean oil in volume of production. On the basis of market evaluation, cottonseed oil maintains a small quality advantage over its chief domestic competitor, but this advantage has been significantly reduced in recent years by technological improvements in soybean oil processing. Future competition between the two major domestic edible oils must therefore be based primarily upon their relative costs—price plus transportation, etc.—to users.

The second major domestic competitor of cottonseed oil is lard. Because it is perishable, lard must be moved into consumption within a reasonable time after production and this fact makes it highly competitive pricewise. During recent years, lard has generally sold for less than crude cottonseed oil; and in 1953, for the first time in many years, substantial quantities were used as an ingredient in commercial shortening.

Historically, shortening provides the largest single market outlet for cottonseed oil. For a brief period in 1947 and 1948, margarine took over first place among market outlets. Since that time, the largest market has been made up of the "winterized" products — salad and cooking oil, mayonnaise and salad dressing. At the present time there is actually a better balance among the markets for cottonseed oil than that which prevailed 10 or 20 years ago. About 40 percent of the oil is going into the "winterized" products, 30 percent is used in shortening, 28 percent enters the production of margarine and 2 percent is consumed in other products. This distribution of cottonseed oil among the major edible uses illustrates its versatility, a characteristic in which it excels its principal competitors.

One of the major disadvantages to which cottonseed oil (and other cottonseed products) has been subject in recent years has been the wide swings in its production. From a low point of 912 million pounds in the 1946 crop year, production of refined cottonseed oil rose to 1,609 million pounds in the 1949 crop year. Cotton acreage controls plus a poor growing season reduced production from the 1950 crop to only 1,112 million pounds. A second postwar recovery in the size of the cotton crop brought cottonseed oil production to an estimated 1,760 million pounds this season. Another application of acreage controls to the 1954 crop, however, is expected to reduce oil production at least 20 percent.

This type of fluctuation is quite undesirable. Buyers are reluctant to base their operations upon commodities that are subject to wide changes in supply and price, and they actively seek substitutes. Soybean oil and lard have not been subject to production control and their supply, while fluctuating, has been more stable than that of cottonseed oil. This has been to their advantage marketwise.

Cottonseed oil's competitors have enjoyed another advantage as a result of the cottonseed price support program. Under this program, Commodity Credit Corporation agrees to purchase a "package" of oil, meal, and linters from mills that pay the support price for seed. Under this arrangement, CCC acquired about 120 million pounds of cottonseed oil out of the 1951 crop and an additional 875 million pounds from the 1952 crop. (Most of this oil is still in storage where it exerts a depressing effect upon the current market.) While this large quantity of cottonseed oil was going into government storage, competitive products were taking over the markets which it normally served. Several different but interrelated factors were involved in this situation.

The CCC price for cottonseed oil was above the market value, and there were no support prices on soybean oil or lard. The support level on both cottonseed and soybeans, was set at 90 percent of parity. The two commodities, however, are not generally comparable valuewise. The products of a ton of soybeans—because of higher meal content—have a higher value than those from a ton of cottonseed. In addition, cottonseed cost considerably more to process. Consequently, if beans and seed are both supported at the same percentage of parity, soybean products can undersell their cottonseed counterparts. This is what happened during the 1951 and 1952 crop years, particularly with respect to oil.

In 1953, support levels were established at 75 percent of parity for cottonseed and at 90 percent for soybeans. This differential compensated in part for the difference in the product values and processing costs of the two commodities and a substantially smaller quantity of cottonseed products has moved to the government. Even so, the bulk of the fats and oils surplus from 1953 crops has accumulated as cottonseed—not soybean—oil.

The recent announcement that 1954 crop soybeans will be supported at 80 percent of parity once again unbalances the relationship between cottonseed and soybeans. As this is written, there has been no announcement of the Department of Agriculture's plans for cottonseed in 1954. Experience of the past three seasons clearly demonstrates, however, that if there is a support program, a reduction in the percentage of parity level, comparable to that for soybeans, will have to be made. Otherwise, the great bulk of the cottonseed crop—either as seed or as products—will move into government hands, with an even greater damage to cottonseed product markets than has already occurred.

Any consideration of the outlook for cottonseed oil must recognize the fact

that the U.S. is a surplus producer of edible fats and oils. Prospective cotton acreage controls in 1954 will not change this situation. Such controls will, as stated above, reduce the production of cottonseed oil. There are, however, several areas where soybeans are, next to cotton, the most profitable cash crop. With no acreage control on beans, they will be planted on a substantial part of the acreage taken out of cotton. Land planted to beans will normally produce more oil per acre than will land planted to cotton. Control of wheat acreage in 1954 will also bring about some shift to soybeans. Corn acreage allotments—recently announced—may bring a further shift. In addition, the corn-hog ratio is currently very favorable and an increase in hog production is indicated this year. Under this combination of circumstances, it is apparent that export outlets for fats and oils are highly important.

On a worldwide basis, per capita production of fats and oils has recovered to a level only slightly below prewar. The "deficit" is largely made up by the increased production of synthetic detergents and other products that can be used in place of fats and oils. After reaching a peak in 1950-51, international trade in fats and oils declined substantially during the following two years. The decline was due partly to smaller world supplies—especially coconut, linseed and sunflower oils—and partly to the reduction, by importing countries, of large stocks accumulated after the outbreak of war in Korea. This liquidation is pretty much completed and international trade is now increasing. This is evident in an increased demand for American soybeans and lard during the current season.

A major obstacle to greater exports of American fats and oils has been limited purchasing power and lack of "free" dollars in the principal importing countries. Any sound action to correct this situation, whether taken by the American or foreign governments, will brighten the outlook for cottonseed oil.

• **Cottonseed Meal and Hulls**—Cottonseed meal in its various forms—cake, meal, pellets, etc.—has been the standard protein supplement of the beef cattle industry for more than half a century. It has been characterized by one leading livestock authority as a "true pioneer" in the nutrition of cattle and sheep, without which the vast range resources of the nation could not have been utilized nor the livestock industry have reached its present stage of development. While soybean meal has been, in recent years, the leading protein concentrate, in volume of production, this has in no way produced the value of cottonseed meal to the livestock industry.

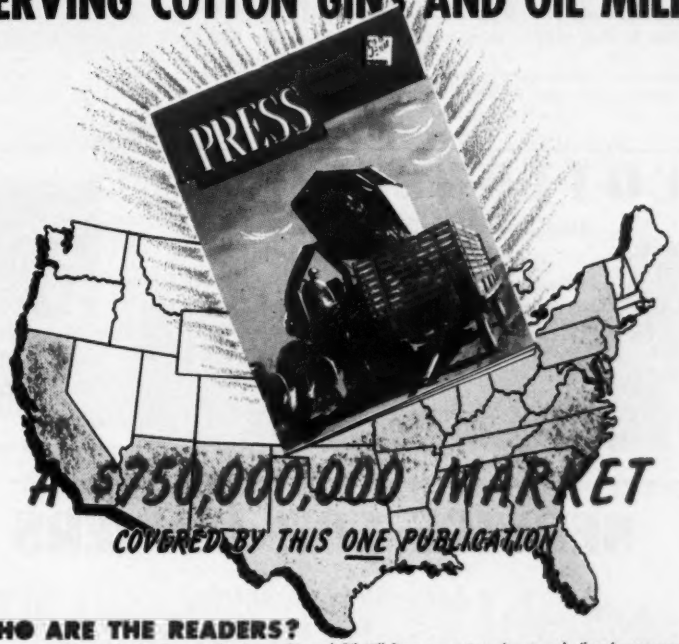
The increase in the use of vegetable protein concentrates in the United States over the past 15 years has been phenomenal. For the 1937-41 period, annual consumption of all types of oilseed meals averaged 3,905,000 tons. During the past several years, annual consumption has ranged from 8,625,000 tons to 9,126,000 tons. For the 1951-53 crop years, cottonseed meal has accounted for about 2,650,000 tons. This rise in meal consumption has been possible because of increased production, a substantial increase in the number of livestock on American farms, and an even greater increase in the use of protein per animal unit.

It is not to be expected that the consumption of protein concentrates will expand in the foreseeable future at as rapid a rate as it has in the recent past. While soybean meal production may increase, as suggested earlier, the rate of such expansion will be slower. Also, the production of beef has, since 1951, shown a rising trend relative to population. Increased use of meal by the beef cattle industry will therefore depend upon an increase in the per capita demand for beef and/or an increase in the use of meal per animal unit. Present per capita consumption of beef is at a record level. While some further increase is certainly possible, it is likely to be small. Feeding authorities are in agreement, however, that there exists a tremendous opportunity further to increase the use of protein per animal unit, not only with respect to beef cattle, but also dairy cattle, hogs and other classes of livestock.

Undoubtedly, cottonseed meal, as a source of protein for cattle, will face increasing competition from non-protein nitrogen sources such as urea and ammoniated feeds. During recent years, research has indicated that such sources of dietary nitrogen may be used by cattle and other ruminants, under certain conditions, to replace significant amounts of the nitrogen normally supplied by cottonseed meal or other natural protein concentrates. The economy of using these non-protein sources of nitrogen for feeding ruminants depends largely on relative prices of cottonseed meal and grains, since additional grain must be fed when a part of the cottonseed meal is replaced by non-protein nitrogen sources.

The outlook for cottonseed meal has been notably improved in recent years by a comprehensive research program involving basic and applied investigations by federal, state and private agencies. This program has the broad objective of improving the nutritive value of meal. One of the minor constituents of cottonseed meal is gossypol which has

SERVING COTTON GINS AND OIL MILLS



WHO ARE THE READERS?

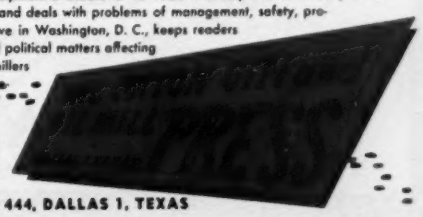
The paid subscribers to The Cotton Gin and Oil Mill Press are cotton ginners and oilseed processors from California to the Carolinas. Total distribution (June 30, 1950) was 7113. This includes approximately 85% of the active cotton gins in the nation, plus complete coverage of the processors of cottonseed, soybeans, peanuts, flaxseed, and tung nuts.

ADVERTISING ACCEPTANCE?

For 52 years leading industrial firms have used The Cotton Gin and Oil Mill Press to promote the sale of machinery, power units, auxiliary equipment and supplies. This publication is now in the unusual but gratifying position of being the only magazine which exclusively serves the cotton ginning and oilseed processing industries. This field represents an invested capital of $750,000,000. . . ten percent of which ($75,000,000) is spent each year for replacements, repairs, and new equipment.

EDITORIAL COVERAGE?

Covering not only current news of the industry, The Cotton Gin and Oil Mill Press reports on new products, new processes, and new equipment available to the trade. It attempts to foster cooperation between all branches of the industry, and deals with problems of management, safety, production, and research. A representative in Washington, D. C., keeps readers constantly informed on legislative and political matters affecting the industry. Cotton ginners and oil millers have looked to this publication for complete news of the industry since 1899.



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limited the quantity of meal that could be fed to hogs and chickens, currently the largest market for protein meal. Research into the nature of gossypol, its measurement, and the processing conditions which minimize its activity has made substantial progress. With the knowledge gained from such research, it is now possible to produce commercial cottonseed meals that can be fed in unrestricted proportion in balanced diets for chicks, broilers and swine. Results of feeding tests also indicate that chick and broiler rations containing equal proportions of cottonseed meal (of the foregoing quality) and soybean meal are equal or superior to rations based on either meal alone. This research program is certainly not completed but results obtained to date, coupled with other market factors described above, make the future outlook for cottonseed meal encouraging.

Cottonseed hulls, used primarily as a roughage feed, have experienced generally favorable markets in recent years. The demand for hulls for feeding has been so strong that it has precluded their use for chemical purposes—an outlet which took significant quantities during World War II and which could be expected to consume increasing quantities if the supply were stable and the price low.

Unlike the protein meals, hay supplies and consumption per animal unit have increased only slightly since prewar. The increase in supplies has been spotty and has not generally occurred in the cotton-producing areas. Drouth conditions during the past three seasons have significantly reduced supplies of roughage in parts of the Cotton Belt and hulls have made a major contribution to the feed supply under those conditions. While subject to wide seasonal variations in demand and price, the general outlook for hulls appears to be favorable.

• **Linters** — Linters, the fourth of the basic products of cottonseed, have historically accounted for 10-12 percent of total product value. The short 1950 crop plus the great increase in demand that followed the outbreak of the Korean War pushed linters prices to the highest levels on record. Since 1951, the price trend has been consistently downward. Increasing competition characterizes the markets for both first and second cut linters.

Changes in the varieties of cotton produced in the U.S. over a period of years have resulted in changes in the characteristics of first cut linters. In general, the staple of such linters is shorter. This makes it more difficult to produce satisfactory bats for use in motor vehicles and furniture. A reduction in the harshness or resiliency of linters produced in certain areas is reported by some users to make them less desirable in the bedding industry. The increasing use of foam rubber and the availability of cotton waste and imported linters at favorable prices have resulted in a decline in the use of first cut linters in these markets, which account for an average annual consumption of around 500,000 bales.

Second cut linters, processed into pulp, compete directly with dissolving and special alpha grade wood pulp. Production of such wood pulp has more than doubled since World War II, its quality has been definitely improved and its price has been sharply reduced. Where it formerly could command a significant premium, linter pulp must now compete with wood pulp on the basis of price. Manufacturers of linter pulp report increasing difficulties from the presence of foreign matter in linters. In part, this results from the increase in mechanical harvesting. Methods of handling seed and limited effectiveness of cleaning equipment are also responsible. This is a matter that requires vigorous action by both ginners and crushers. The latter are at present pushing a broad program of research designed to improve the efficiency of seed cleaning equipment. Ginners can contribute by shipping to oil mills seed that is just as clean as is possible with the facilities they have available.

One encouraging development in the linters market during the past several years is the substantial increase in consumption by the manufacturers of "rag content" papers. The presence of synthetic fibers in the rags which such manufacturers have traditionally used has caused them to seek other sources of raw material. This market now accounts for about 4 percent of total linters consumption and appears capable of expansion to several times that amount.

Dominating the linters picture over the past two years has been the cottonseed price support program. The CCC price for linters purchased as part of the "package" (previously described) has been consistently above their market value. This has encouraged the use of competitors while linters accumulated in government storage. CCC currently holds nearly one million bales of linters. On the basis of this experience, it is apparent that the support program, if continued, must be modified to permit linters to sell at competitive prices. In addition, every possible step must be taken to improve the cleanliness of seed and linters so that the latter may be competitive from a quality standpoint. Otherwise, the future of linters is not bright.

In this brief review, some factors have necessarily been omitted and others treated in a limited manner. Basically, the future of cottonseed products is good. To realize their potentialities, however, such products must be able to meet competition in terms of quality and price. Inability to do so will penalize crushers, ginners and producers.

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Soybeans To Be Grown In North Texas Area

Farmers in Fannin County, Texas, will have a market for soybeans this year, according to an announcement made by Hi-Yield Fertilizer Co., Bonham. The company has said that contracts have been made with crushers to purchase all soybeans produced in the county in 1954 at a guaranteed price.

Ginning Machine-Stripped Cotton

(Continued from Page 89)

cased in burs; therefore, a second drier is added so that the seed cotton can be dried after most of the burs have been removed in the master bur extractor. Experience indicates that any gin attempting to handle large quantities of this type cotton will need to be equipped with two full size driers utilizing separate two million BTU heat units.

If an airline cleaner is used to remove large quantities of sand, then it should definitely follow a green boll trap and should be slowed down to prevent chopping up the green bolls which escape the trap.

Sticks, stems, and vegetative branches have been a problem in machine-stripped cotton from the beginning, but they become almost unmanageable in the cotton gin when they are green and pliable. Dry, brittle stems and branches may be broken up in the ginning process, but large quantities of green stems and branches cause choking in all parts of the cotton gin, sometimes to the extent that they must be removed by hand. There are, at present, no commercial stick removers available to cotton ginners to eliminate this major source of trouble. However, an experimental model now being tested by the U.S. Cotton Ginning Laboratory at Stoneville, Miss., and the Oklahoma Cotton Research Station Gin, Chickasha, Okla., holds real promise of eliminating this major source of trouble in the next couple of years.

The green leaf encountered in machine-stripped cotton of this type is successfully handled by being broken up and removed in the cleaning, drying, extracting, moting, and lint cleaning processes. However, when green leaf is attached to terminal branches or to vegetative branches and included in the cotton brought to the gin, it offers a more severe problem than the individual green leaves picked with the spindle-type picker. It is therefore vital that care be taken in the harvesting process to prevent breaking off green branches with large clusters of leaves.

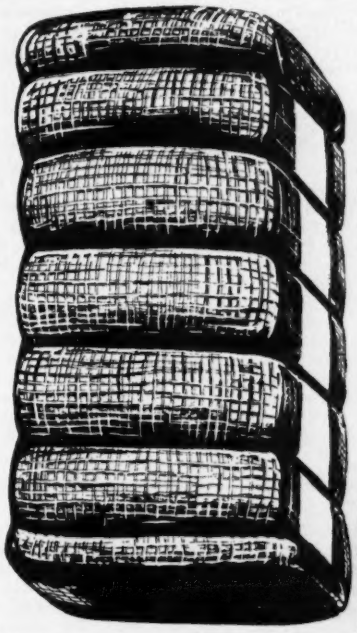
Dead bark from the outer layer of the cotton stalk or large branches is more often removed in one of the ginning processes described above. However, strippers that have a tendency to roll up long strips of green bark create a problem that the gin does not handle very satisfactorily. When such rolls of bark become enmeshed with cotton fibers, much of such green bark is shredded by the gin saws and invariably follows the fibers to the bale.

For lack of a better term, I use the words "vegetative moisture" to describe a condition associated with ginning stripped cottons which contain a large amount of green foreign matter. Such cottons generally remain in the trailer for several hours, and sometimes several days, before they can be ginned. Green bolls, as a part of such foreign matter, are often "nicked" or "punctured." Cotton fibers in close contact with such green vegetative matter apparently draw off much of this moisture. In any event, the ginners are concerned with the drying problem associated with handling cottons which have absorbed this green, sappy moisture. It is an additional problem which the ginners face in handling machine-stripped cottons containing large amounts of green foreign materials. It is another reason for adequate drying equipment in the gin.

The importance of preventing the chopping of green bolls has been mentioned previously. It should be noted that when these are so chopped up as to release green, moisture-laden cottonseed, that such seed do not respond properly to the saw and rib action of the cotton gin but cause congestion and sometimes complete shut-downs for the machinery to be cleaned. It is important, therefore, both in harvesting and at the gin, that whatever green bolls are harvested must be so handled as to prevent their being chopped up and distributed throughout the mature cotton fibers.

Grass is another major problem associated with stripping at whatever harvest period. Cotton ginning machinery is at present ineffective at removing grass. The only alternative, at this time, is to prevent gathering large amounts of grass or grass seeds with seed cotton.

Metal in seed cotton is still another problem child of the ginner. Scrap metals cause costly fires and machinery break-downs in cotton gins. Foreign metal materials include wire, bolts, nuts, screws, nails, and machinery parts, and



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no one seems able satisfactorily to explain their presence in such quantity in seed cotton. Machine-stripped cottons bring their share of scrap metal to the gins, so magnets should be installed to minimize damage from this source.

Dry leaf, dirt, sand, and motes offer very little, if any, more difficulty in machine-stripped cotton than in hand-snapped cotton. As a matter of fact, some machine-stripped cottons received at gins in sandy areas this season contained from 50 to 250 pounds *less sand per bale* than hand-snapped.

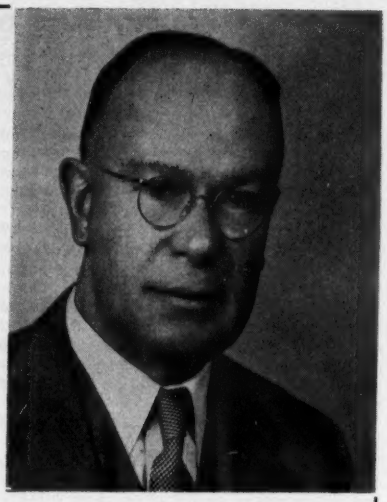
From the above brief analysis of the problems of handling green machine-stripped cotton it must not be assumed that these cannot be handled at the gin following careful operation of the mechanical stripper. Quite to the contrary, some gins have been equipped and are doing a fine job on the more carefully machine-stripped cottons in areas far removed from the parts of West Texas and Oklahoma traditionally associated with machine-stripping. As a matter of fact, one gin in North Texas, from which samples were taken regularly in 1952, ginned approximately 3,000 bales divided equally between machine-stripped cotton harvested before frost and hand-snapped cotton. This gin averaged Middling cotton for the whole season under harvesting conditions which might be considered ideal and conditions of defoliation which might be considered far above the average. The difference between good defoliation and good stripper operation and poor defoliation, coupled with poor stripper operation, was evident in cotton on the gin yards in 1953. Some machine-stripped cottons have ranged as low as Strict Good Ordinary to below grade, and many new owners of machine-strippers have found their first harvesting trials to be bitter experiences. However, there is little doubt in my mind that, with improved defoliation, careful operation of the stripper and proper ginning equipment, machine-stripping may find its place in many areas of the Cotton Belt, as a harvesting method of great value to producers.

At the present time, therefore, a ginner undertaking to handle large quantities of cotton machine-stripped before a frost can expect to do the best job if his equipment includes these machines, or their equivalent, in the following order: A green boll trap, full size tower drier, cylinder cleaner, master bur extractor, full size drier, cylinder cleaner, large unit extractor-feeders, gin stands, and lint flue cleaners, with the total cleaning cylinders not to exceed 24. An airline cleaner may be added for special purposes discussed above, but it should be by-passed when not absolutely essential lest it cause the difficulties previously discussed.

Even with this equipment and with proper operation, the emphasis must be upon proper defoliation and stripper operation; otherwise, the grades will fall and their bale value will be penalized. Continued improvement of cotton strippers is inevitable but *care should be taken that these be sold in quantity only in areas where crop and climatic conditions will give a good stripping machine and a good gin plant an opportunity to do an acceptable job.* Many areas of the Cotton Belt are not at present suited for mechanical stripping because of plant type and size, moisture conditions, grassy fields at harvest time, and other obvious conditions which cannot be successfully overcome with the stripper and the cotton gin in their present state of development. In other areas the mechanical cotton picker offers advantages not likely soon to be overcome by the stripper. In still other areas where plant size and other conditions point to successful harvesting by the stripper method, the necessary addition of cotton gin machinery will be too great in cost because of low ginning volume.

Nevertheless, improved types of strippers will find their way into new sections of the Cotton Belt where their low cost harvesting advantages will be properly utilized. They will not provide the total answer to the farmer's problems but will be recognized as an added piece of farm equipment to help in the march toward mechanized cotton production. It will be to the benefit of all ginners, therefore, to acquaint themselves with the ginning problems that arrive with the stripper. Research and practical experience have pointed the way. I am confident that ginners will meet the challenge.

Make Every Acre Do Its Duty



By M. J. HARPER

President, Mississippi Cottonseed Crushers' Association

■ IN THE 1954-55 season we have acreage controls staring us in the face; accordingly, it is imperative that every acre planted to cotton be made to do its full duty. This can be accomplished by the so called "Package Program," i.e., planting the best acres to cotton, use of best planting seed obtainable, intensive cultivation, heavy fertilization, proper poisoning program, harvesting cotton as clean as possible, and finally, taking the seed cotton to a gin that can and will do a good job of ginning.

County agents will assist with advice as to planting, poisoning and cultivation, state colleges or commissioners of agriculture will offer their recommendations as to best use of fertilizer and what kinds to use. These agencies are anxious to help in every way possible and will do it gladly.

The Mississippi Cottonseed Crushers' Association has for some years made a large yearly contribution toward prize money for the Five-Acre Cotton Contest. The results each year have demonstrated what can be done in increasing yields per acre. Of course one realizes that farming, say 500 acres and five acres, is somewhat different; however, the five-acre farmer has demonstrated what can be done, so following at least some of his practices will be profitable even for the large operator.

By following the "Package Program," I believe every acre can be made to do its full duty. Possibly some farmers will not see the necessity of following the full program, but should be strongly urged to do so by all ginners and crushers, for by following the full program all will benefit.

John M. Moye, Ginner, Dies in Arkansas

Funeral services were held Feb. 14 in Westor, Ark., for John M. Moye, Lee County ginner. Moye was a lifelong resident of Lee County. He was 69 years old.

Moye was a deacon in Walls Chapel Baptist Church, Westor, and a member of the County Quorum Court.

Survivors include his wife, Mrs. Ethel Felton Moye; a son, John M., Jr., Marianna; a daughter, Mrs. John W. Woodrome, Westor; two sisters, Mrs. Lalla Coffee, Palestine; and Mrs. Earl Pasley of Louisiana; two half-brothers, Earl Moye and W. D. Moye, Marianna; and two grandchildren.

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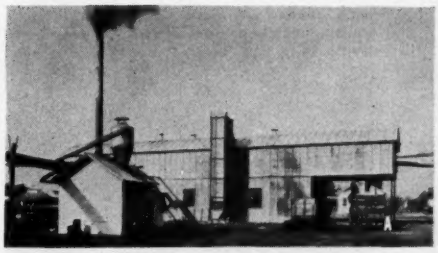
Ginning Research

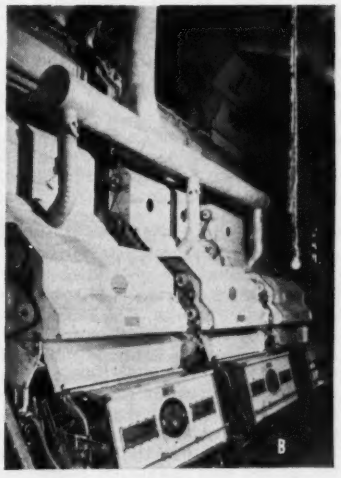
(Continued from Page 86)

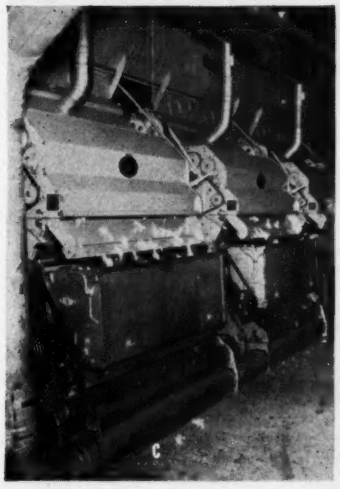
fits. Both screw and hydraulic type presses were commonly used, with updraft condensers being predominant. Trampers were of all types and usually troublesome. Independent saw-and-brush drives were much in use because the buildings were generally two-story structures. Steam engine and electric motor vied in popularity, with the former losing ground as cheap fuel disappeared, and as internal combustion engines grew in favor at cotton gins.

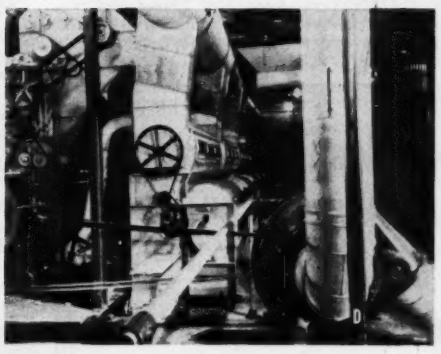
How, when and where to obtain improved drying, cleaning, extracting, greater-density packaging, more efficient operation and economies were all challenges to the Laboratory. The analysis of each stage and type of ginning device makes for a double-barrelled fire against inferior ginning. Such research may not only discover superior systems and principles, but it also may develop better operating methods. As other conditions in the cotton production and allied practices change, such research must keep in step. This is especially true in regional research which should continue along these lines, not only because it is sorely needed, at the present time, but because it pays substantial dividends alike to producer, ginner, cotton mill and ultimate user.

In Figure 1 we have endeavored to portray by random photos some of the more widely known features that the U.S. Department of Agriculture has achieved from the research studies. It shows examples of partial progress from inferior to superior ginning by means of seed cotton drying; a betterment that further resulted in cleaners and feeders when drying methods were incorporated as shown; a self-cleaning method for keeping planting seed purer at the gin; a lint cleaning stage of processing that made the products of rougher harvesting more profitable to the producer; and a gin-compression method for the bales that has numerous good features. Most ginners are familiar with these and other widely used results from the federal ginning research.









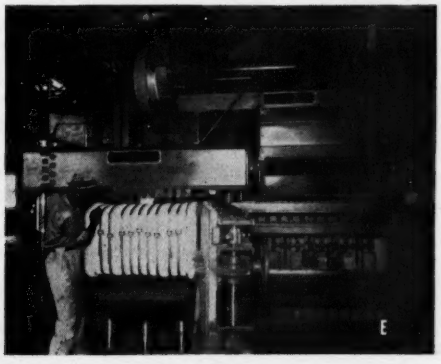


Figure 1. Examples of research progress in ginning. A, a Mississippi Valley tower drier and gin; B, hot air manifold for feeders and overhead cleaner; C, a pre-war seed-dropper and blow system beneath gin stands; D, lint cleaners in a modern gin; E, research standard density bales in the cotton gin.

The applied research of the Cotton Ginning Laboratory in questions of gin saw teeth, pitch, speed, rib-spacing, doffing adjustment, seed-board and lambrequin controls and other elements are also affording benefits. With newer devices and developments such elements must promptly be studied and observed in action from every possible angle, so that no great mistakes occur in selection and recommendation as to types of machinery best suited for particular services.

Among the interesting developments and inventions that have emanated from the ginning research at the Cotton Ginning Laboratories, the author is greatly interested in one that is a sort of "hybrid" between fundamental and applied research. This is the recipro-cleaner, whose cross-section is depicted in Figure 2. There have been a series of patents and foreign inventions dealing with ways and means for cleaning the fibers while they were still in the grip of the gin saw teeth. The recipro-cleaner of the U.S. Department of Agriculture ginning research project utilizes lint cleaning or scutching principles plus self-cleaning operation of fibers on moving knife edge bars. Thus both the fibers are cleaned by scutching, and the keen-angle bars are themselves kept clean by the fibers, constituting a sort of hybrid between the results from fundamental and applied research. Compare this performance of operation within the cotton gin stand to the more elaborate lint-cleaning of the U.S. Department of Agriculture-type lint cleaner. In the latter, principles were discovered whereby freshly ginned fiber could be seized by a second set of saw teeth and scutched or cleaned by flailing the fibers against arcuate assemblies of grid bars. Applied research to achieve effective mechanical means for sidewise movement of these grid bars to keep them clean from accumulations of vegetable and insect adhesive led to the recipro-cleaner, because stationary bars rapidly became unusable under some conditions, unless they could be kept clean.

Much still remains to be done in making these inventions adaptable to a diverse group of gin stand designs. The field is still wide open toward improving better gin stands with a view to further increasing the fiber quality improvements in grade and smoothness, economy of operation and greater capacity per saw or roller, even though present gins are far superior to their older models.

Roller ginning, whose origin is shrouded in the mists of antiquity (pardon the trite quotation from many historians), is a subject of active research at the laboratory in Mesilla Park, N.M., where the saw ginning of arid and irrigated region cotton is also studied, as it is for rain-grown cottons at Stoneville—and for complex intermediates at Chickasha, Okla.

Figure 3 shows a roller gin, to which has been added the modern lint-suction attachment developed by the U.S. De-

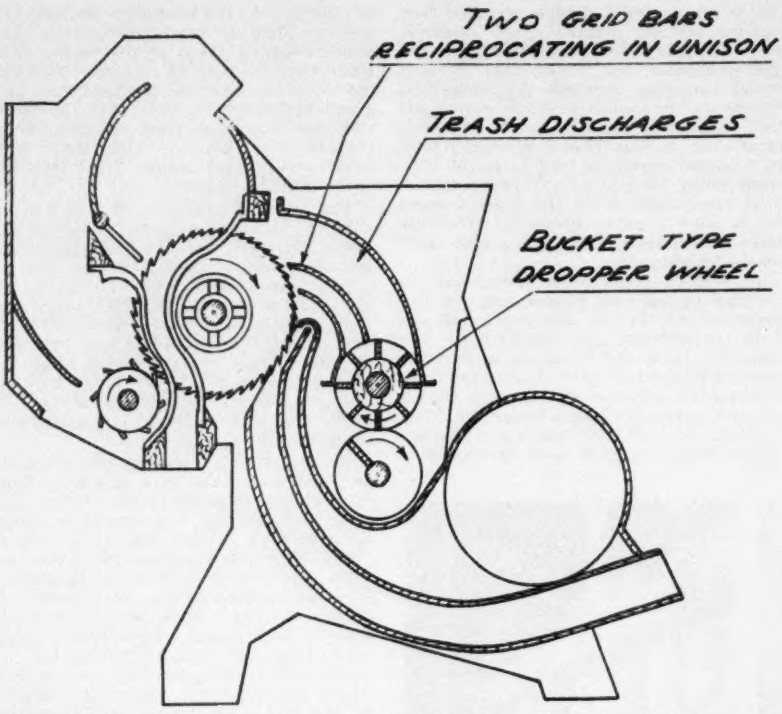


Figure 2. Diagram of cross section of recipro-cleaner (a government research development) within a cotton gin stand.

partment of Agriculture cotton ginning research. This form of attachment (and others since devised) make for a modernization of the roller gin, so that lint cleaning may ultimately be achieved, which is one objective of the government work.

Figure 4 shows another product of the cotton ginning research that is now arousing considerable interest in areas where stripping and gleaning methods of harvest bring quantities of sticks, stems and burs to the gin. This extraction method of stick removal is now under close study at the Chickasha Ginning Laboratory, in cooperation with the Agricultural and Mechanical College of Oklahoma. From test-tube idea to full size unit to the proving ground for refinements is the course that this and other machines must traverse before they can be recommended to the industry. Recommendation and release, of course, do not insure instant adoption. Frequently a decade passes before some of the research products become adopted.

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Again, see Figure 5, where the U.S. Department of Agriculture-design planting seed cleaner-drier-sterilizer-cooler is undergoing proving ground runs at a plantation producing pedigreed seed. The work of the Cotton Ginning Laboratory involved much research, study and experiment before the present machine was evolved.

Mechanized production of cotton, rougher harvesting, pink bollworm eradication, more uniform processing without overdrying, and other demands are now focusing their forces, in part, upon the urgency of further ginning research. As an example, at the Mesilla Park Laboratory where both roller and saw ginning research are being conducted, there are needs for:

A—A new attack on problems of incineration and trash disposal;

B—Better destruction of pink bollworms throughout each process and stage of cotton ginning;

C—Further amplification of studies on

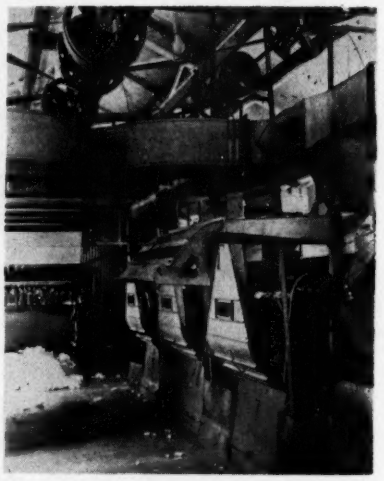

Figure 3. View within a long staple roller ginning establishment fitted with government-design accessible suction hoods and lint flue showing press at far end closed for pressing.

elimination and effective control of static electricity in ginning processes;

D—Improved, legitimate moisture restoration for low moisture content seed cotton, either artificially or field dried;

E—More economical units of machinery for every stage in the ginning process, and better bales in density, appearance, covering and general quality.

Adequate drying makes for smoother and better cleaning, but often the resulting moisture content is below that for best results for ginning and subsequent pressing. Hence it may at times be desirable to add moisture concurrently with ginning. Means for this low percentage moisture restoration involves thorough control and good uniformity of application whereby the cotton may retain all of its desirable qualities and grade improvements. Since each phase of the ginning processes has an individual moisture content requirement for best results, there is a general step-up in moisture content necessary after the cleaning and extracting. In these and other aspects of present-day ginning research, the old-time simplicity of the cotton gin may have been converted to

Figure 4. Research with newest government-design stick remover unit, Oklahoma A. & M. Cotton Station at Chickasha. Left to right: Dr. Hawkins, Engineer Luscombe, Dr. Schroeder and Engineer Franks.

modern complexity—but research is at work in streamlining it to full effectiveness.

The larger gins now face mechanized cotton production with more assurance, because they have previous experience as a guide, and with that information research should be able to render aid. The change-over of small southeastern farms to mechanized production, especially to low-priced harvesting of mechanical types, poses a very difficult problem in the low-volume gins. Costs of modernization are great, and monetary rewards must be assured to warrant such investments. As a result of this situation, interest in establishment of a regional research ginning laboratory for the Southeastern States has been growing steadily.

Nevertheless, even the larger gins with modern equipment cannot gin for specific channels of utilization nor guarantee an unbroken out-turn of a fixed grade unless all conditions are favorable. The low-volume gin is in a much more difficult position. As mechanization progresses on small cotton farms, these low-volume gins will receive an increasing bulk of machine harvested cottons. To aid in these cases, the stick-remover and other research developments may in time produce enough improved efficiency of operation to reduce cost and enable these small-volume gins to render effective service.

Except in California, where only one variety of seed cotton prevails, there is no region in the U.S. in which the ginner may consistently produce even-running lots of bales at all times with a fixed hourly turnout. In many areas, with adequate equipment and well harvested seed cottons, a gin may produce 10 pounds of fiber per saw per hour, but the ginner cannot govern the weather, methods of harvesting or varieties of cotton. With such variable raw products and conditions, research should provide a greater degree of "control" over every process than at present exists.

In the research programs of the Ginning Laboratories of the Agricultural Research Service of the Department of Agriculture, attention is always focused upon the feasibility of making practical applications of research findings so that producers and ginners may continue to share definite, tangible benefits along with the cotton industry.

At the same time, abuses often follow legitimate uses, but sensible corrections by means of Extension education, practical experience and objections by the trade are often sufficient to make necessary corrections. It should not be necessary to do any policing by means of research. Also, cotton processes, classifications and grades have improved during the century to identify the desirable qualities, or their absence, in order to satisfy the mills.

Hence a primary aim of research in cotton ginning is still to eliminate current losses and enhance the grade and preparation of each bale within profitable limits; and a second ideal for research is to try to produce the cleanest, most uniform, highest quality bale through controlled, precision methods that eliminate guesswork, chance and variability. To achieve these, cotton ginning research activities bear a heavy responsibility.

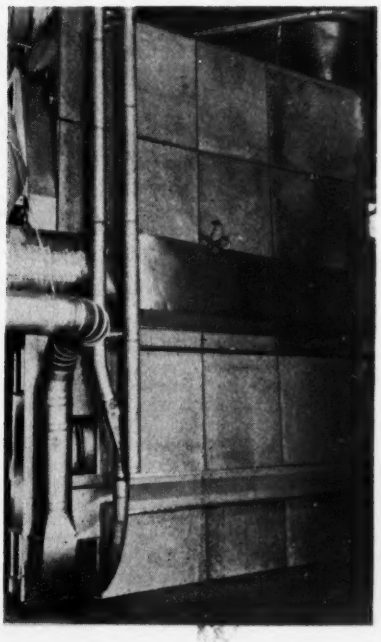

Figure 5. A government-design research planting seed drying-cleaning-sterilizing and cooling unit in operation on proving ground tests at a pedigreed seed breeder's foundation farm.

Release of Unused Acres Urged in Louisiana

Louisiana Delta Council has urged the State Agricultural Stabilization and Conservation Committee to "spare no efforts in attempting to have farmers release cotton acreage which they do not intend to plant so that this acreage may be shifted to other farmers."

President Grayson Guthrie, Monroe, said that farmers who voluntarily release such so-called "frozen acreage" will benefit themselves since their own farm gets credit for planting the acreage, even though someone else actually does plant it. And, Guthrie pointed out, "If they don't release their allotment and don't plant it, then their farm loses credit for the acreage in figuring future allotments."

The statement expressed concern over the economic plight confronting many Northeast Louisiana farmers as a result of the acreage formula.

$80 Million Spent for Cotton Insect Control

Average costs of applying insecticides, exclusive of the cost of materials, for controlling cotton pests has been estimated at 50 cents an acre for dusting and 75 cents for spraying. Over-all cost each year, from 1950 to 1952, for applying insecticides to cotton was at least $80 million.

141- and 176-Saw Change-Over Equipment

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LINTER SAWS . . . DROP-FORGED STEEL RIB GRATE FALLS . . . STEEL RAKE HEADS . . . SAW MANDRELS . . . BALL BEARINGS . . . FLOATS . . . ALUMINUM SPACE BOARDS

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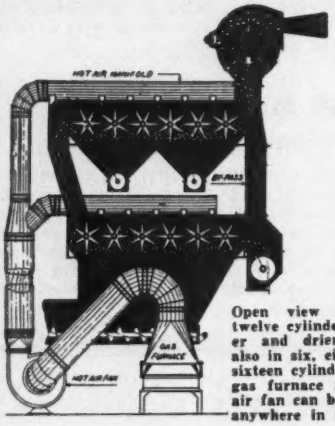
STACY COTTON CLEANER AND DRIER



Open view of our twelve cylinder cleaner and drier. Made also in six, eight and sixteen cylinders. The gas furnace and hot air fan can be placed anywhere in the gin.

A careful study of the open view cut at the left will convince any ginner of the effectiveness of the Stacy Cotton Cleaning System and Drier. Note the hot air is blown through the cotton by a series of nozzles (similar to the air blast nozzles on a gin stand), forcing the dirt, leaf trash, and stems through the screen. The moist air does not follow the cotton.

The cleaner is used every day you gin. When a wet bale comes in—turn on the heat. There is no dead investment. We furnish Heaters for natural gas, butane and propane.

Closed view of our eight cylinder cleaner and drier.

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laugh it off

A lady, somewhat embarrassed by the unexpected gift of a baby alligator, placed it in the bathtub temporarily before rushing out to keep an engagement. When she returned, she found this note from her maid:

"Sorry. Ise quit you-all. I doan want to work in a house where they's a alligator. I'd a-tole you but I didn't think the question would ever come up."

• • •

"Were you aware," asked the Soviet scientist of a companion, "that Adam and Eve were actually Russians?"

"Why, no, I wasn't," replied the other, interested. "Can you prove it?"

"Easily," said the scientist. "Adam and Eve had no clothes and no house. The only thing they had to eat was apples. And they thought they were in paradise. They must have been Russians!"

• • •

Mr.: "I'm not arguing with you."
Mrs.: "No, but you were listening in a very unpleasant manner."

• • •

Elmer and Susan were taking a spin along a country road. Nothing was said for the first ten miles. Suddenly Elmer stopped the car, turned to her and said, "I'm a man of few words. Do you neck, or don't you?"

Susan: "I'm a girl of few words. I don't but you've talked me into it."

• • •

It is strange that when people engage in the argument as to which came first, the egg or the hen, it never occurs to them that perhaps the rooster figured somewhere in the sequence.

• • •

The late William Wrigley was once riding with a friend in a crack express train from New York to Chicago. His companion was curious to know why the magnate continued to spend so much money on advertising.

"Your gum is known all over the world," he said. "Why don't you save the millions you are spending on advertising?"

Wrigley pondered a second and then asked, "How fast is this train going?"

"About 60 miles an hour," replied the other.

"Then," asked Wrigley, "why doesn't the railway company remove the engine and let the train travel on its own momentum?"

• • •

There are some people who sow wild oats all week and go to church Sunday to pray for a crop failure.

• • •

There was a knock on the door of the dormitory room.

"May I come in?" said a male voice. "It's the room I had when I went to college here."

"Yes, sir," he continued. "Same old room, same old furniture, same old view of the campus, same old closet."

He opened the closet door. There stood a girl, terrified.

"That's my sister," said the occupant of the room.

"Yes, sir," he replied, "same old story."

• • •

Tourists are people who travel thousands of miles to get a picture of themselves standing by the car.

The MITCHELL *Super Chief*

gives top performance with all makes of gins:

CENTENNIAL
CONTINENTAL
HARDWICKE-ETTER
LUMMUS
MURRAY

Now, every ginner can get MAXIMUM *extracting-cleaning capacity* with MINIMUM upkeep and maintenance costs and time with

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The new 1954 Super Chief . . . designed to fit any make of gin stand . . . is the finest extracting-cleaning machine in our history. Join the hundreds of satisfied Super Chief users all over the country who are profiting from savings in upkeep and maintenance and in better ginning efficiency.

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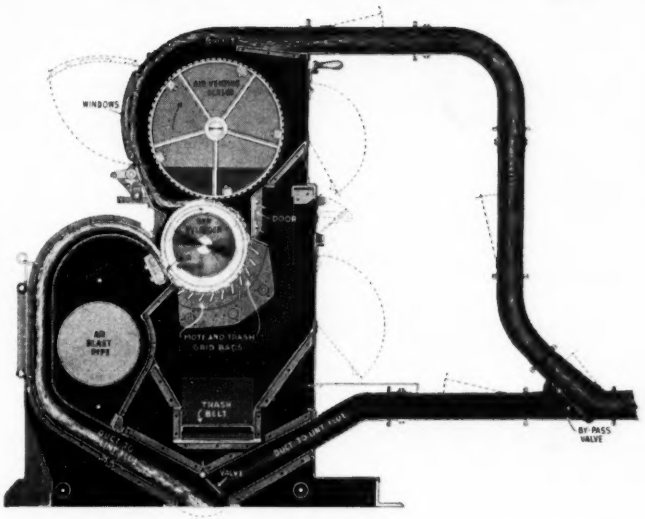
"Profitable to Ginner & Producer"

Write for special bulletin



HARDWICKE-ETTER COMPANY

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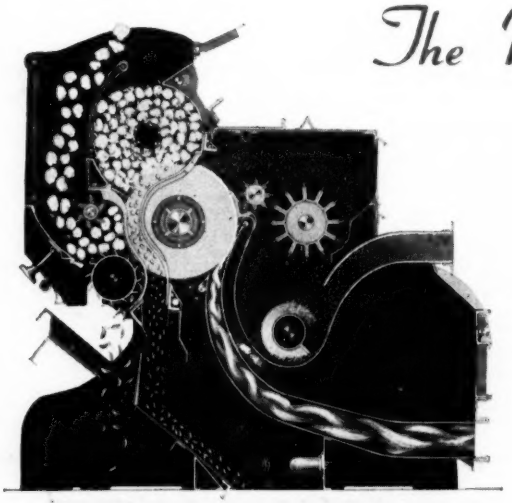
The New

MURRAY 90

"Safety Gins"



The one Gin HAVING ALL features wanted by owners and operators

These amazing NEW 90-SAW GINS have been designed throughout with a view of affording operating personnel the greatest possible safety protection. The entire front assembly is hinged at the bottom, so that the top swings forward and away from Saw Cylinder. Sprocket and Chain Drives and Ends of Saw Cylinder are fully enclosed with Safety Shields. Actual field tests in various locations have shown a positive increase in capacity ranging from 12½ to 25 percent. It is a completely new Gin, of much heavier design, produced by precision methods, and requiring a minimum of adjustments.

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